# PIT AND QUARRY

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MARCH, 1941

Aggregates for Shasta Dam . . . The Concrete-Products Conventions . . . Southwestern Improves Victorville and El Paso Plants . . . Concrete Pipe for Deer Creek Aqueduct

# LUDLOW-SAYLOR

## CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

for super-severe service

●

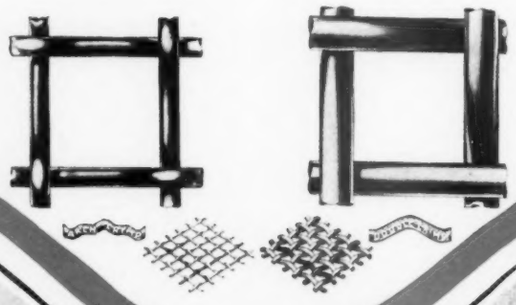
SUPER-HARD, SUPER-TOUGH, SUPER-STRONG

## CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

**withstand abrasion** longer—

**endure vibration** better—

**resist fatigue** to the utmost



The background at top of page shows the "Perfect" Double-Crimp Weave.

The small cuts in the center panel compare Arch-Crimp Weave and Double-Crimp Weave.

The border at foot of page shows "Perfect" Double-Crimp Steel Wire Cloth which has been hot-dip galvanized after weaving.

Samples on request.

The LUDLOW-SAYLOR WIRE COMPANY
SAINT LOUIS

Hoeffkin Bros. keep things humming at their East Alton (Ill.) Ready Mixed Concrete plant with this 1-yard crane. The successful performance of BAY CITY equipment results from long, wide crawlers giving higher stability—unit-cast heat-treated alloy steel bases providing greater strength and durability with less weight—simplified machinery assembly combining speed, power and easy operation. Nothing has been sacrificed in the sturdy proven design as our business has been built by offering BIG MACHINE VALUE.

*WRITE for CATALOG H-3*

**BAY CITY SHOVELS, Inc., Bay City, Michigan**

**BAY CITY SHOVELS**
12 Sizes
3/8 to 1½ Yard
Also truck mounted shovels and cranes

# BAY CITY

SHOVELS • CRANES • DRAGLINES • TRENCH-HOES • SKIMMERS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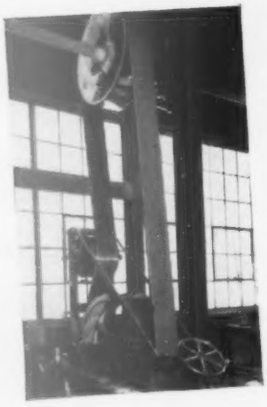
# A RECORD CUT IN MARBLE



THE drive you see here runs a twelve-bladed gang saw that slices huge blocks of marble into a dozen slabs — *simultaneously!* Belt after belt was tried on it, but they stretched and slipped so under the terrific load, frequent shutdowns were necessary to cut out slack. Then, just ten years ago, this drive was fitted with a Goodyear COMPASS "40" truly endless belt on recommendation of the G.T.M. — Goodyear Technical Man. There have been no shutdowns since for belt repair—*because the* COMPASS *hasn't stretched in ten years of grueling service.* That is why today all 24 gang saws in this plant are COMPASS-driven. The saving in repair expense alone more than pays the cost of the COMPASS belts! Why not see the G.T.M. about a COMPASS for your belt-eating drives? Write Goodyear, Akron, Ohio, or Los Angeles, California — or phone the nearest Goodyear Mechanical Rubber Goods Distributor.

THE GREATEST NAME IN RUBBER

GOODYEAR

Compass—T. M. The Goodyear Tire & Rubber Company

GTM-Specified

GOODYEAR COMPASS "40" BELT

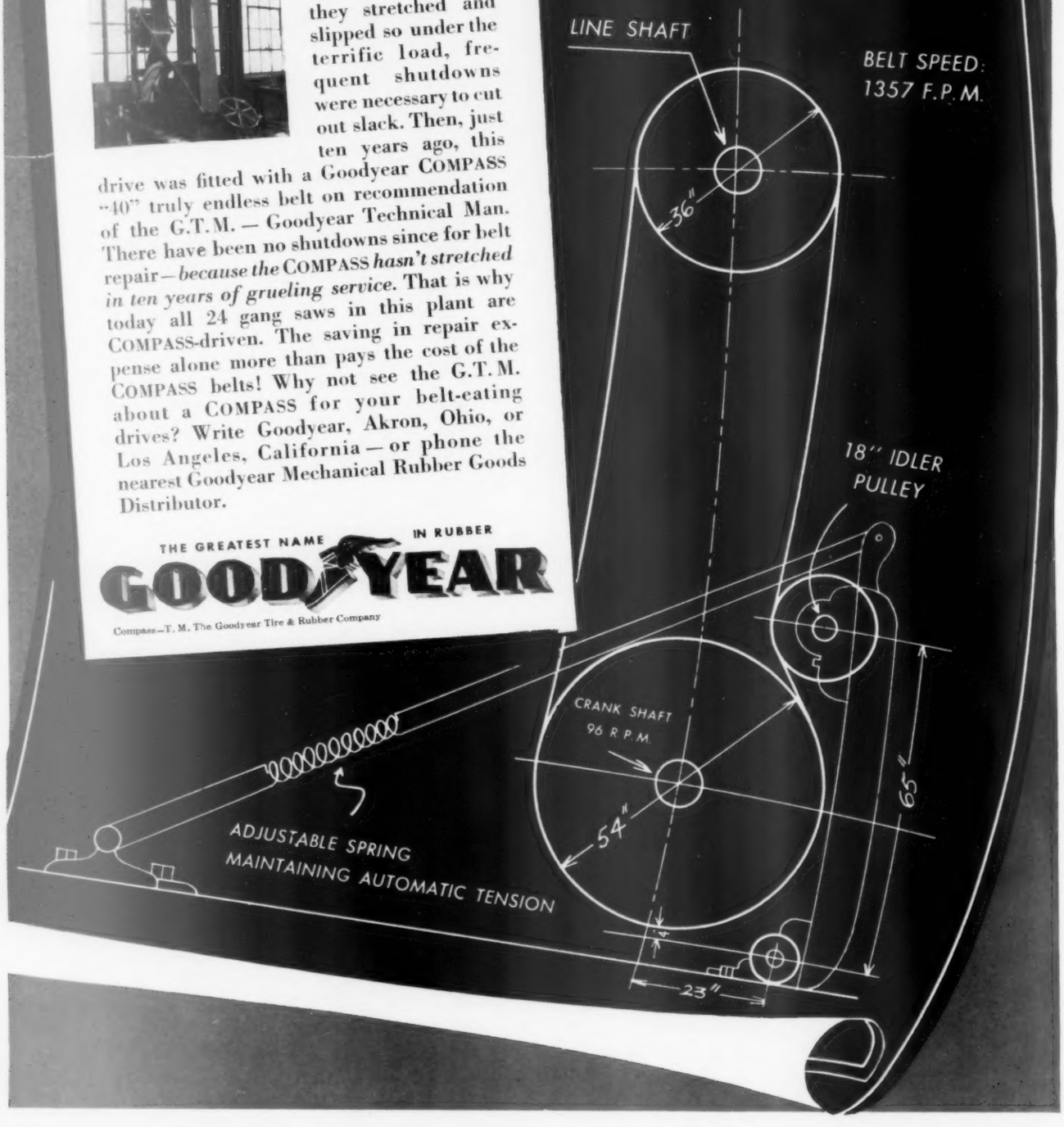
31'8" long x 10" wide (truly endless)

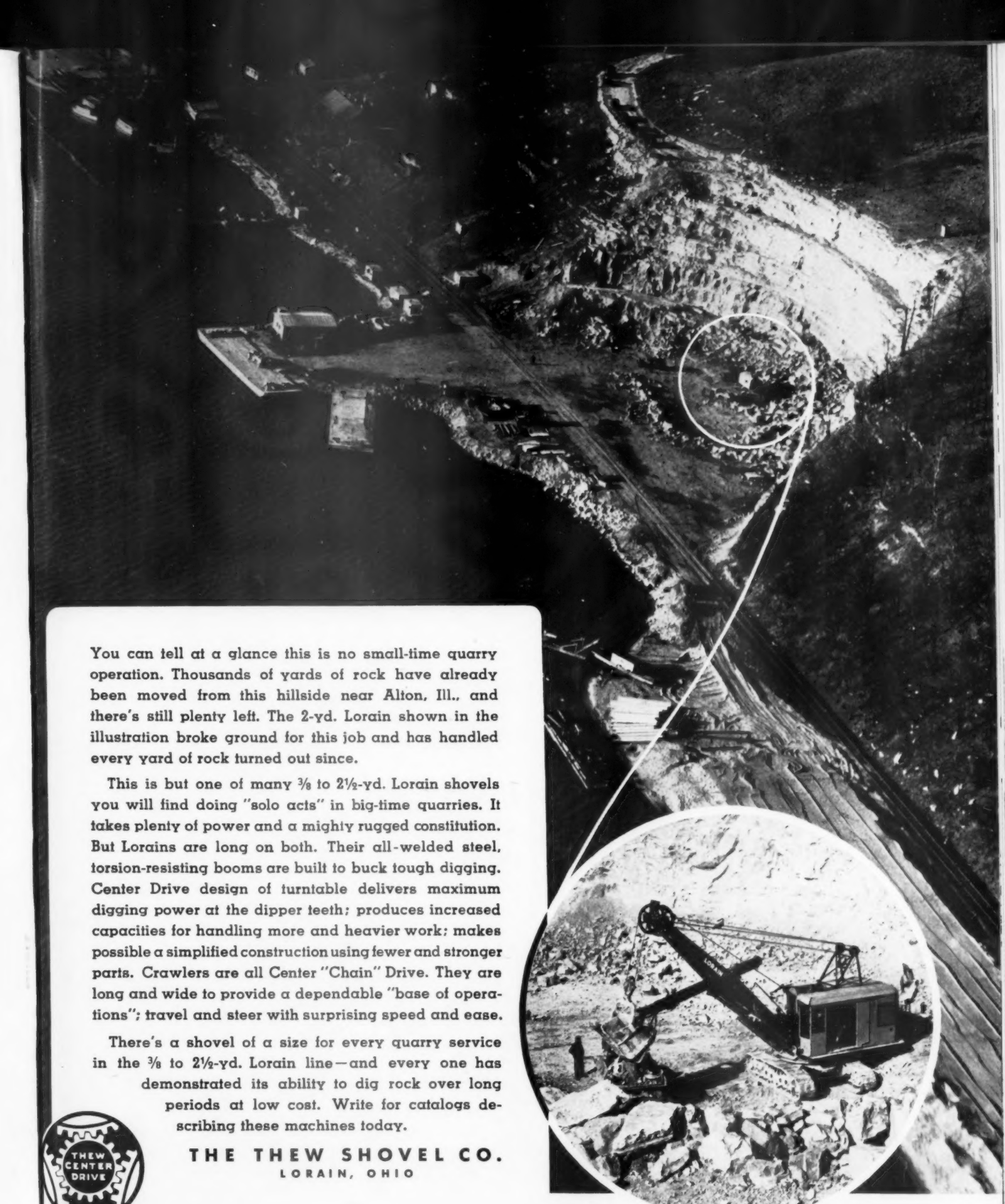
for MARBLE GANG-SAW DRIVE

The Georgia Marble Company

Tate, Georgia

Installed: April 6, 1931





You can tell at a glance this is no small-time quarry operation. Thousands of yards of rock have already been moved from this hillside near Alton, Ill., and there's still plenty left. The 2-yd. Lorain shown in the illustration broke ground for this job and has handled every yard of rock turned out since.

This is but one of many ⅜ to 2½-yd. Lorain shovels you will find doing "solo acts" in big-time quarries. It takes plenty of power and a mighty rugged constitution. But Lorains are long on both. Their all-welded steel, torsion-resisting booms are built to buck tough digging. Center Drive design of turntable delivers maximum digging power at the dipper teeth; produces increased capacities for handling more and heavier work; makes possible a simplified construction using fewer and stronger parts. Crawlers are all Center "Chain" Drive. They are long and wide to provide a dependable "base of operations"; travel and steer with surprising speed and ease.

There's a shovel of a size for every quarry service in the ⅜ to 2½-yd. Lorain line—and every one has demonstrated its ability to dig rock over long periods at low cost. Write for catalogs describing these machines today.

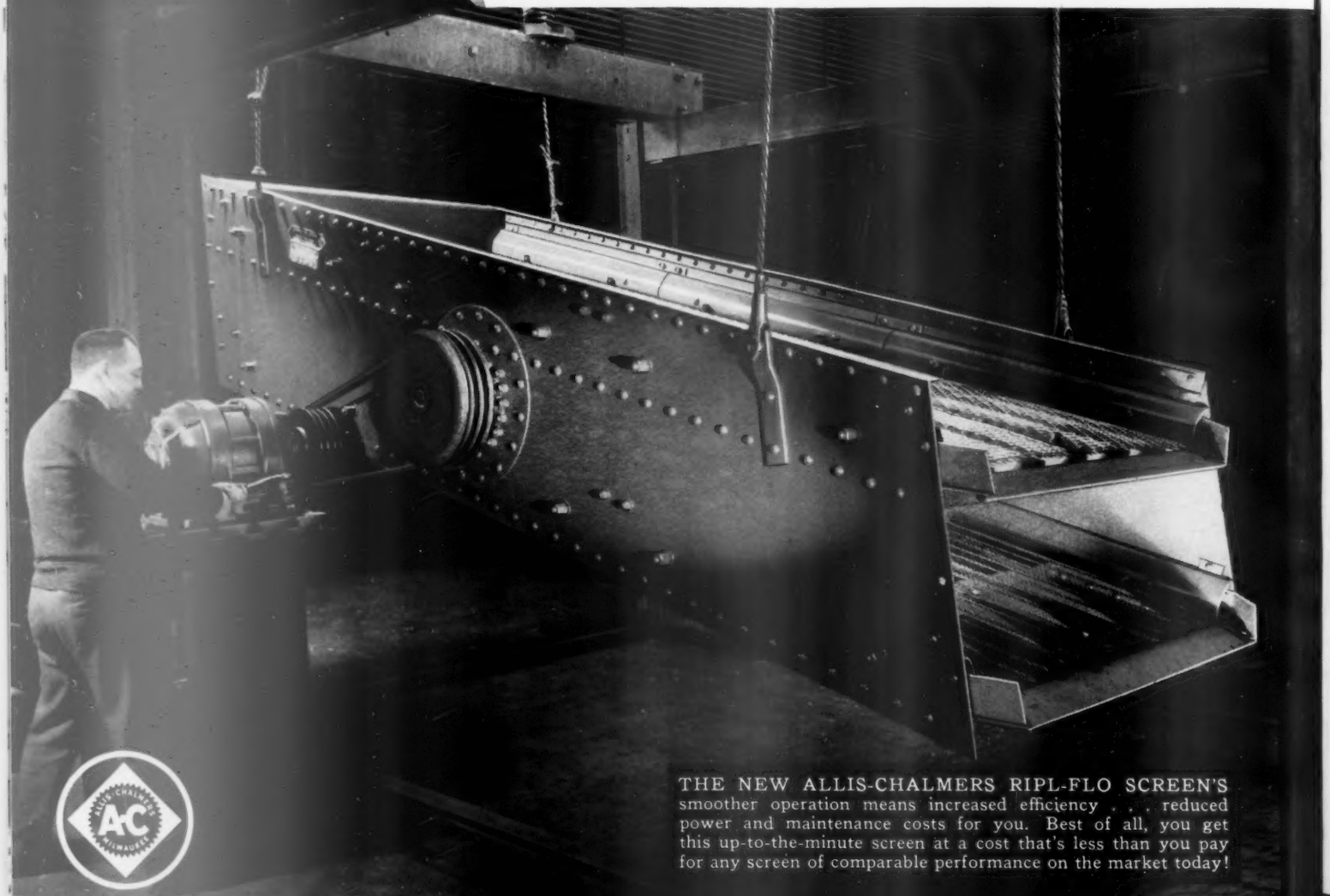
THEW CENTER DRIVE

**THE THEW SHOVEL CO.**
LORAIN, OHIO

# 3/8 to 2 1/2 Yd. LORAINS

# ALLIS-CHALMERS THE

**Ripl-Flo Costs You Less Than Any Screen With Comparable Performance on the Market Today!**



THE NEW ALLIS-CHALMERS RIPL-FLO SCREEN'S smoother operation means increased efficiency . . . reduced power and maintenance costs for you. Best of all, you get this up-to-the-minute screen at a cost that's less than you pay for any screen of comparable performance on the market today!

## *Let* ALLIS-CHALMERS COOPERATIVE

# ANNOUNCES RIPL-FLO

## A REMARKABLE NEW VIBRATING SCREEN THAT CAN CUT YOUR SCREENING COSTS!

**1. INCREASED EFFICIENCY!** The Ripl-Flo's new principle of circle throw does more than just shake the material. It *rolls* it over and over . . . practically eliminating blinding . . . really steps up your screening efficiency!

**2. SMOOTHER OPERATION!** "Like water flowing over a riffle!" said one operator after watching the Ripl-Flo in action. Because of the dynamically balanced mechanism, you get a screen that's *smooth* starting . . . *smooth* running . . . *smooth* stopping!

**3. REDUCED POWER CONSUMPTION!** By a unique means of balancing, Allis-Chalmers screening specialists *slashed* the Ripl-Flo's power requirements to about 60% of other screens of similar capacity. You save 40 cents of every power dollar . . . and still get four-bearing performance!

**4. QUICK, EASY INSTALLATION!** It's easy to install the new Ripl-Flo . . . with either cable suspension or floor mounting! Rugged springs prevent transmittal of vibration. Built-in discharge spouts give you a neater, less expensive installation. And a second deck can be added in the field if you want an additional product size.

**5. LOWER MAINTENANCE COSTS!** Your maintenance costs with the Ripl-Flo are remarkably low . . . thanks to Allis-Chalmers cooperative engineering! Transverse crowning of the cloth assures even tension . . . cuts deterioration. All welds are stress relieved through annealing. In fact, every part is designed to give you long years of trouble-free service.

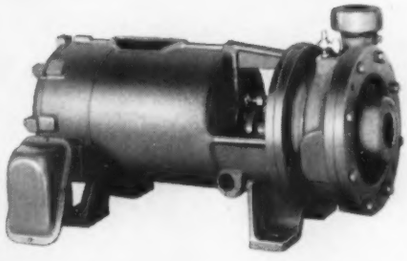
**6. INITIAL COST LESS!** Because all superfluous parts have been left off, you get the new Ripl-Flo Screen . . . with all its engineering advancements . . . *at a cost that's actually less* than you pay for any comparable screen on the market today!

Remember, whether it's screening . . . or any other problem that may arise in your daily operations, call in an Allis-Chalmers specialist in the district office near you. Working with your own engineers . . . backed up by Allis-Chalmers cooperative engineering . . . he'll help you get the *right* machine for the job you want done.

## ENGINEERING *Cut your costs*

*News of other Allis-Chalmers Products that cut your costs!*

THE NEW, LARGER SIZE NO. 636 Type "R" Crusher developed to give more plants a better product . . . easier . . . at lower cost. Here a No. 636 . . . with "Speed-Set" product control . . . is installed in a Texas plant.



ALL-IN-ONE PUMP—THE ALLIS-Chalmers Electrifugal—with extra value features at no extra cost . . . delivers more gallons of water per power dollar.

DRIVING A CONVEYOR IN AN Indiana plant, this Allis-Chalmers Lo-Maintenance Motor handled 4,000,000 tons of material in five years . . . without one cent for repairs.

A-1356

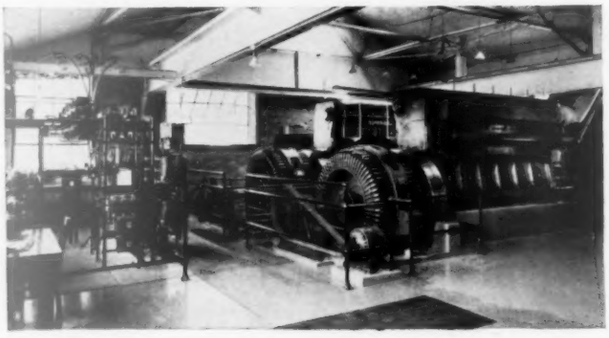
# How many times has opportunity knocked at your door?

THE Columbia Quarry Co., of St. Louis, Mo., has heard the knock of opportunity six times, and each time they have opened the door to larger earnings and more savings by the use of Diesel power . . . They played it safe every time and bought Superior Diesels until now they have a total of 3100 H.P.

*As a result what have they gained?*

Power at consistently under one cent per K.W.H. . . Fewer power interruptions . . . Production of stone doubled and tripled . . . New markets resulting from increased output and lower production costs.

*Let us help you recognize these opportunities when they exist for you.*



Superior DIESELS

HEAVY DUTY MODELS: 50 to 900 H. P. 250 to 720 R. P. M.

HIGH SPEED MODELS: 15 to 230 H. P. 600 to 1800 R. P. M.

**THE NATIONAL SUPPLY COMPANY . . . SUPERIOR ENGINE DIVISION**

FACTORIES: Springfield, Ohio; Philadelphia, Pa. • SALES OFFICES: Springfield, Ohio; Philadelphia, Pa.; New York, N. Y.; Los Angeles, Cal.; Jacksonville, Fla.; Houston, Texas

## LeTOURNEAU 'DOZER-CARRYALL HANDLING METHOD

# "Tripled Production at Minimum Cost"

**. . . writes B. F. Gibson, resident superintendent of the American Zinc Company's Mascot, Tennessee, plant . . .**

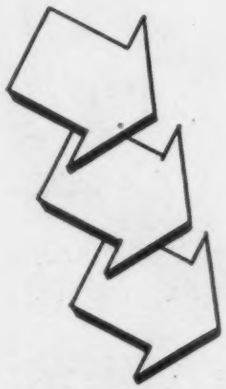
"We use LeTourneau equipment exclusively in our operation because we have found that since our establishment of a 'Dozer and Carryall system several years ago our production has tripled . . . and our cost in time, labor, maintenance and upkeep has been at an absolute minimum."

### Dependable Performance in the Pinches

Mr. Gibson continues . . . "At one time, on a rush order for sand, two Carryalls and two 'Dozers loaded 110 sixty-ton railroad cars in 10 hours and maintained this production for a two-months' period!"

### Fast, Low Cost Handling from Mill to Cars

Two 8-yard LeTourneau Carryall Scrapers, working behind "Caterpillar" D7 tractors, load the lime-stone sand (by-product of zinc mining) at the mill release area . . . carry and stockpile it at the storage area . . . all in one continuous operating cycle. From there, LeTourneau 'Dozers feed the sand and gravel, as it is needed, through a hopper onto a conveyor belt, which loads the freight cars.



One handling gets sand from the mill to the stockpile with this LeTourneau Carryall self-loading, -hauling, -dumping rig. One man—the tractor operator—handles every Scraper operation. That cuts handling costs . . . saves time . . . speeds production.

This operation has proved so successful that the American Zinc Company's LeTourneau equipment fleet now totals 2 Carryalls and 3 'Dozers here at their Mascot, Tennessee, plant.

LeTourneau Bulldozer with "Caterpillar" D7 tractor, used to feed hoppers, move big yardages of material over short distances etc.

### Scores of Other Money-Saving Uses...

Like the American Zinc Company, and other leaders throughout the pit and quarry industry, you'll find LeTourneau equipment will provide a low-cost solution to your materials-handling problems. Clearing new pit areas . . . stripping overburden . . . stockpiling . . . building roads and dikes, etc. Best place to see how LeTourneau equipment can save you money is right on your own property. Call your LeTourneau-"Caterpillar" dealer for a demonstration . . . NOW!

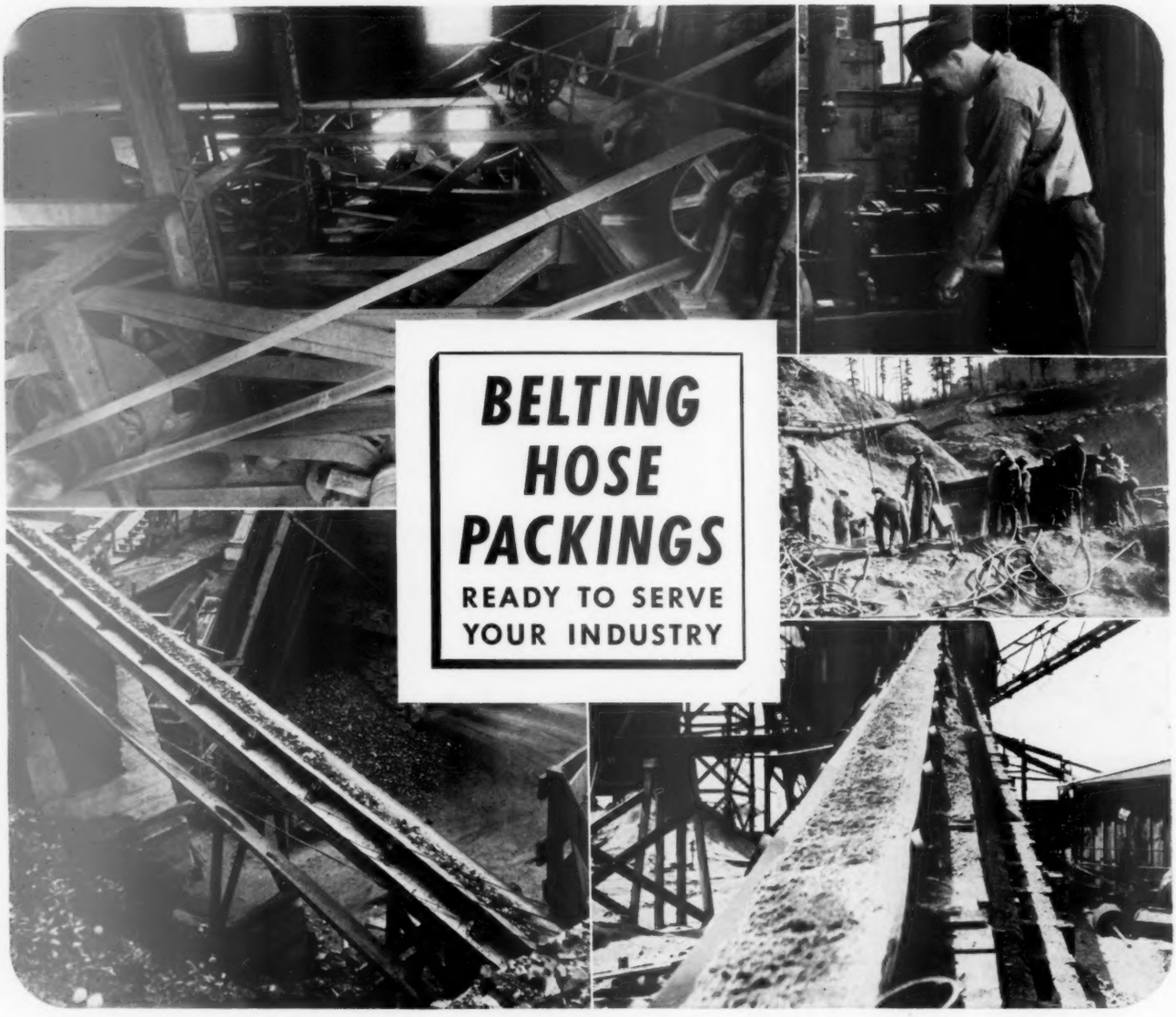
**R. G. LeTOURNEAU, INC.**

**Cable Address: "Bobletorno"**

**Carryall* Scrapers, Angledozers*, Bulldozers, Rooters*, Power Control Units, Drag Scrapers, Cranes, Pushdozers, Sheep's Foot Rollers, Tournapulls*, Tournatrailers*, Tournacranes.** *Name Reg. U. S. Pat. Off.

# LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA




# "QUAKER *Has what you want!"*

To deliver extra tonnage of materials with speed and economy in the Sand—Gravel—Stone—Cement and kindred fields.

Quaker's Belting—Hose—Packings have demonstrated their ability and quality—under all conditions, some far from ideal, to stand the "gaff" and give extra long service, because each has been specifically made to fit the exact requirements where they are operating.

**WRITE • WIRE PHONE ORDERS**

Progressive Quaker is continually adding new and costly equipment—testing in the laboratory and in the field under actual working conditions to maintain the high standard of quality—for which Quaker is noted. Large warehouse stocks at Philadelphia, Chicago, Houston, San Francisco and other industrial centers.

Quaker's experienced engineers and belt experts are available on any belt problem. They can help you—call on us now.

**SPECIFY QUAKER—WHEN AND WHERE INDUSTRIAL PRODUCTS ARE NEEDED**

## QUAKER RUBBER CORPORATION

OVER 50 YEARS CONSISTENT QUALITY

**PHILADELPHIA**

***NEW YORK • BUFFALO • CHICAGO • MEMPHIS • HOUSTON • SAN FRANCISCO***

# DUNKED IN HOT LUBRICANT FOR LONGER LIFE

## Purple Strand Wire Rope

This length of hemp rope is about to become the center of a piece of Bethlehem Purple Strand wire rope. Every fibre of this hemp rope has been impregnated with a compound that both lubricates and preserves.

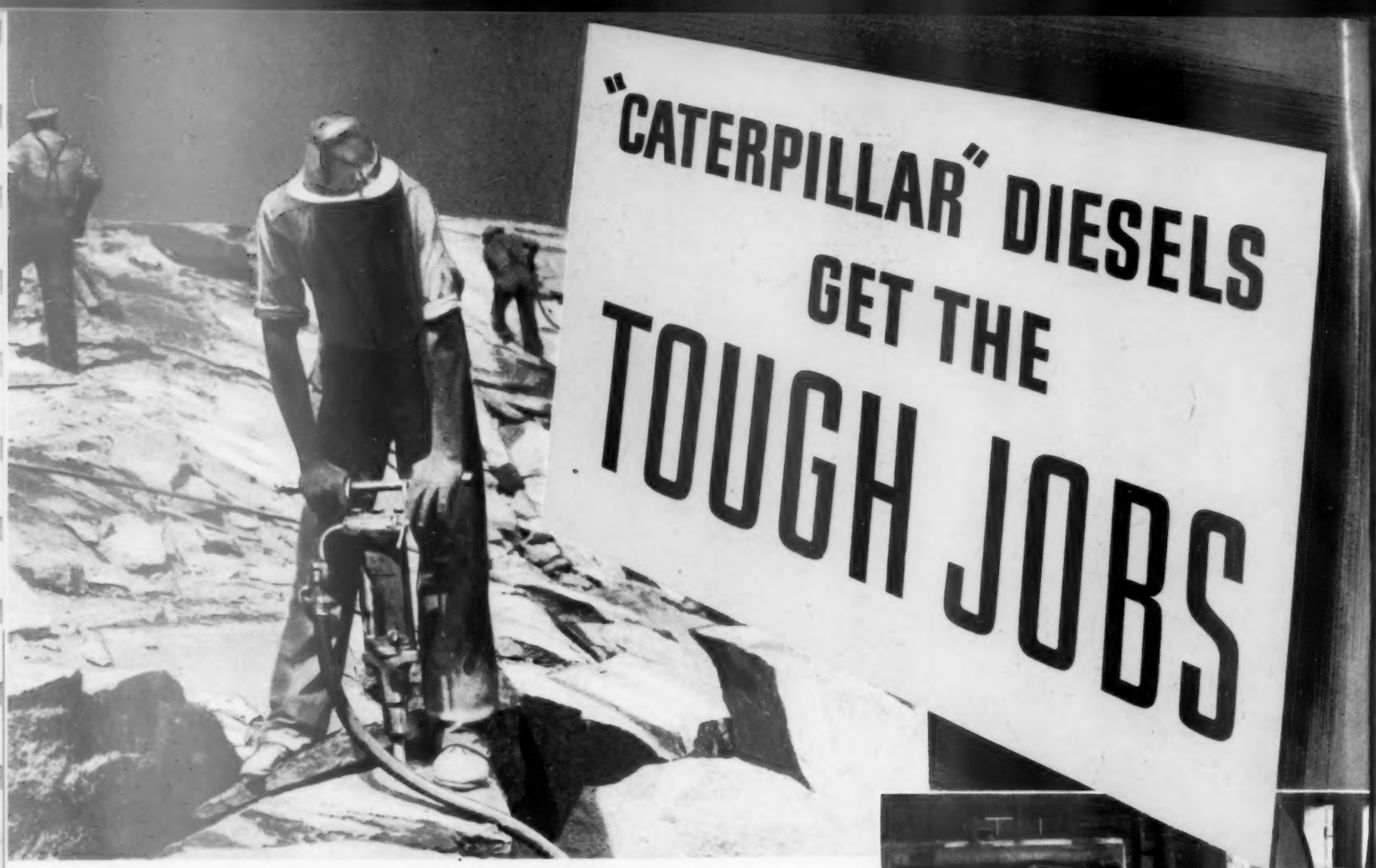
Now, as a further protection, the hemp core plunges into a vat of hot lubricant, emerges with a thick, smooth coating and is pulled, together with the strands, into the closing die. Here the strands close around it. The hot lubricant is squeezed uniformly into every nook and cranny, and the rope is ready for shipment.

When you consider that the strands in Bethlehem wire rope are themselves bathed with a lubricant which is basically matched to the core lubrication, you see how thoroughly Bethlehem handles this important problem.

Why not try Bethlehem Purple Strand on your own job? It's made of premium Improved Plow Steel, is manufactured on new machinery; its individual parts fit together with accurate precision. The performance record of this fine rope is its best salesman.

BETHLEHEM STEEL

**BETHLEHEM STEEL COMPANY**



# "CATERPILLAR" DIESELS GET THE TOUGH JOBS

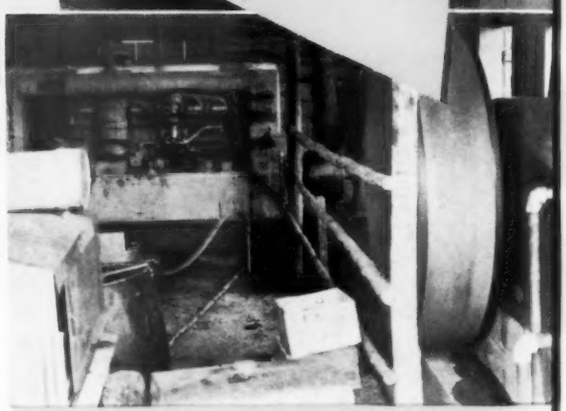
THAT'S because these compact, rugged, powerful engines can "take it"! They'll put up with punishment that would send many a less carefully built engine into an early repair or overhaul bill. Dependable power for the tough jobs—that's "Caterpillar" Diesel!

That's why these engines are the constantly increasing choice of pit-and-quarry men. R. F. Hedrick, of Siler City, N. C., is one of them. With a "Caterpillar" D13000 he reports crushing hard granite at a *fuel cost of less than 1 cent a ton.* With another D13000 he drives an Ingersoll-Rand 14x12 compressor.

Each engine uses only 3½ to 4 gallons of 7¼-cent fuel per hour during a 10-hour day. With the exclusive "Caterpillar" fuel system, you don't need premium fuels but can burn such extra-cheap, low grades as No. 2 and No. 3 domestic burner oils.

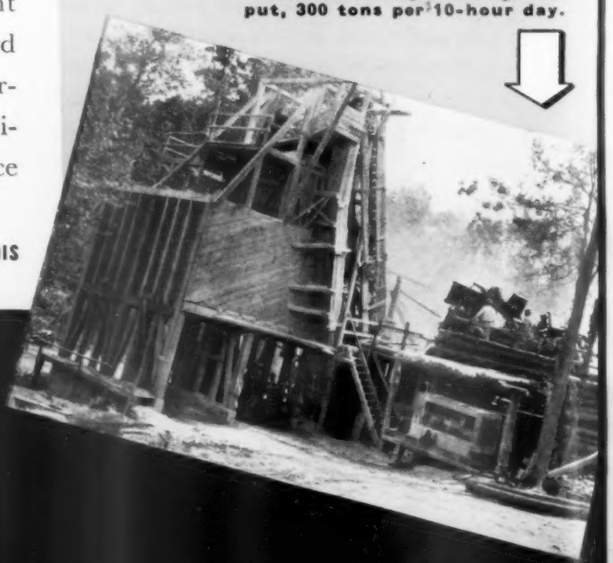
There are many other features about "Caterpillar" Diesel Engines —toward low maintenance, operating simplicity, dependable performance and long serviceable life. But their outstanding ECONOMY alone should be sufficient reason for heading at once toward your "Caterpillar" dealer for further information. Or, write us direct for literature giving experience of other operators in your field.

**CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS**



● **Mr. Hedrick's compressor power—for supplying air for drill, 3 jack hammers, a bit sharpener and 2 forges. Compresses 550 cu. ft. of air per minute on about 30c worth of fuel an hour.**

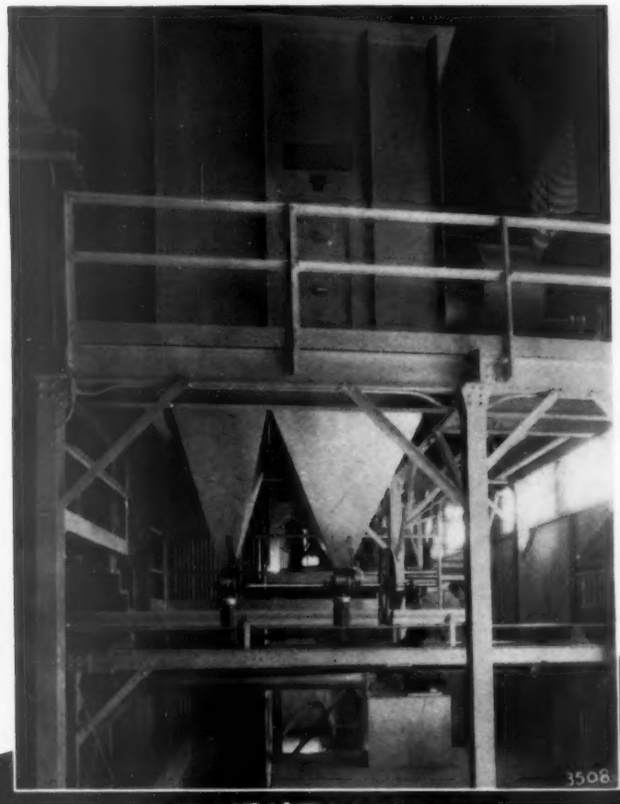
● **Mr. Hedrick's crusher power—for two crushers, 3-deck screen, bucket elevator and conveyor. Average output, 300 tons per 10-hour day.**



**CATERPILLAR**
REG. U.S. PAT. OFF.
*Diesel*

ENGINES AND ELECTRIC SETS • TRACK-TYPE TRACTORS • ROAD MACHINERY

# Why Buy SLY?




• Sly Dust Filter in the packhouse of a cement plant. Rotary valves on the dust hoppers and a screw conveyor return the collected dust automatically.

## 5 EXCLUSIVE FEATURES WHICH MAKE SLY DUST CONTROL A 4 TO 1 FAVORITE IN THE CEMENT INDUSTRY

**1 MORE FILTERING CLOTH.** For any specified amount of money or in any specified amount of space Sly gives you many more square feet of effective filter cloth area—greater filtering capacity per cubic foot of space.

**2 TAUT BAGS (Patented).** Sly horizontal cloth filter bags are always held *taut*—a patented feature. This insures: (1) a constant *minimum* resistance to the air, and (2) removal of dust more quickly and more thoroughly since the *entire* bag is vibrated *uniformly* during the shaking period.

**3 SIMPLER SHAKER MECHANISM.** Consisting of many less moving parts, the Sly shaker mechanism is far simpler, resulting in less maintenance and lower costs.

**4 AUTOMATIC CONTROL.** Sly gives you *any degree of automatic control* up to *complete* automatic; minimizing or even removing entirely the human factor, thereby achieving most economical operation and maintenance.

**5 BAGS MORE EASILY REPLACED.** Although Sly filter bags last a long time, when the bags do need replacing any individual worn bag can be readily located and easily replaced without disturbing the others—an exclusive Sly feature.

• In brief, Sly Dust Filters are so constructed throughout that they save on space, on power and on maintenance. That these advantages are widely appreciated in the cement industry is evident from the fact that Sly is a 4 to 1 favorite. If you have a dust problem—in the cement industry or rock products field—our engineers will help you solve it. Ask for Bulletin 98.

**THE W. W. SLY MANUFACTURING CO. • 4745 Train Ave., Cleveland, O.**

BRANCH OFFICES IN PRINCIPAL CITIES

**SLY**

INDUSTRIAL DUST CONTROL

# WE BROKE WITH TRADITION...

## TRI CLAD INDUCTION MOTOR

*Gives extra protection 3 ways*

## 1 *Extra Protection*

### AGAINST PHYSICAL DAMAGE

One-piece cast-iron frame and cast-iron end shields protect the vital parts — from external blows, falling objects, or dripping liquids—keep them safe and secure even under slam-bang conditions. The entire stator frame, including integrally cast feet, is built to give all-round strength without excess weight.

BUILT FOR PROTECTION FIRST . . . TO LAST

# ...TO BUILD THIS NEW MOTOR

## 2 *Extra Protection*

### AGAINST ELECTRICAL BREAKDOWN

Stator winding of Formex* wire—the toughest magnet wire ever developed—gives extra protection against moisture, oil, abrasion, and heat-aging. New synthetic-resin bonding varnish and Glyptal No. 1201 Red on end windings make a sturdy unit with a durable finish. You get a motor you can count on for continuous service year after year.

*Reg. U.S. Pat. Off.

## 3 *Extra Protection*

### AGAINST OPERATING WEAR AND TEAR

Sleeve bearings are of new design —have a scientifically determined length and diameter and a method of grooving that assures a continuous oil film over the entire bearing surface. A new and simple ball-bearing mounting assures correct alignment and exclusion of foreign materials—bearings can be cleaned and greased without disassembling.

OUR field studies had shown that, more and more, the requirements of industry were demanding a vastly improved general-purpose motor, and it was apparent that this demanded a radically new approach on the part of the designer. Similarly, design studies showed that only by making a fresh start could full advantage be taken of the materials and methods that were newly available. Only by matching up *all* the new wants and *all* the new ways of doing things, in a supreme effort to make a *long jump* ahead—instead of the traditional *step* ahead—was it possible to achieve the truly modern motor you asked for.

And now you have the Tri-Clad motor—a completely new design. More than 15 important improvements have been built into it. And for the reason that so many major improvements were concentrated in one design, we had to have just that much more assurance that each one was thoroughly practical. Never before, we believe, has the manufacturer required a motor to prove itself so thoroughly in advance of initial sale.

Whatever the task you have for a general-purpose motor —whatever your special concern for appearance, convenience, quietness, *or* protection—you will find that the performance-tested features of the Tri-Clad motor will give you specific benefits on the job. General Electric, Schenectady, N. Y.

*Integral-hp sizes up to 20 hp (at 3600 rpm), open and splashproof, are now available. Also capacitor motors up to 5 hp (at 3600 rpm).*

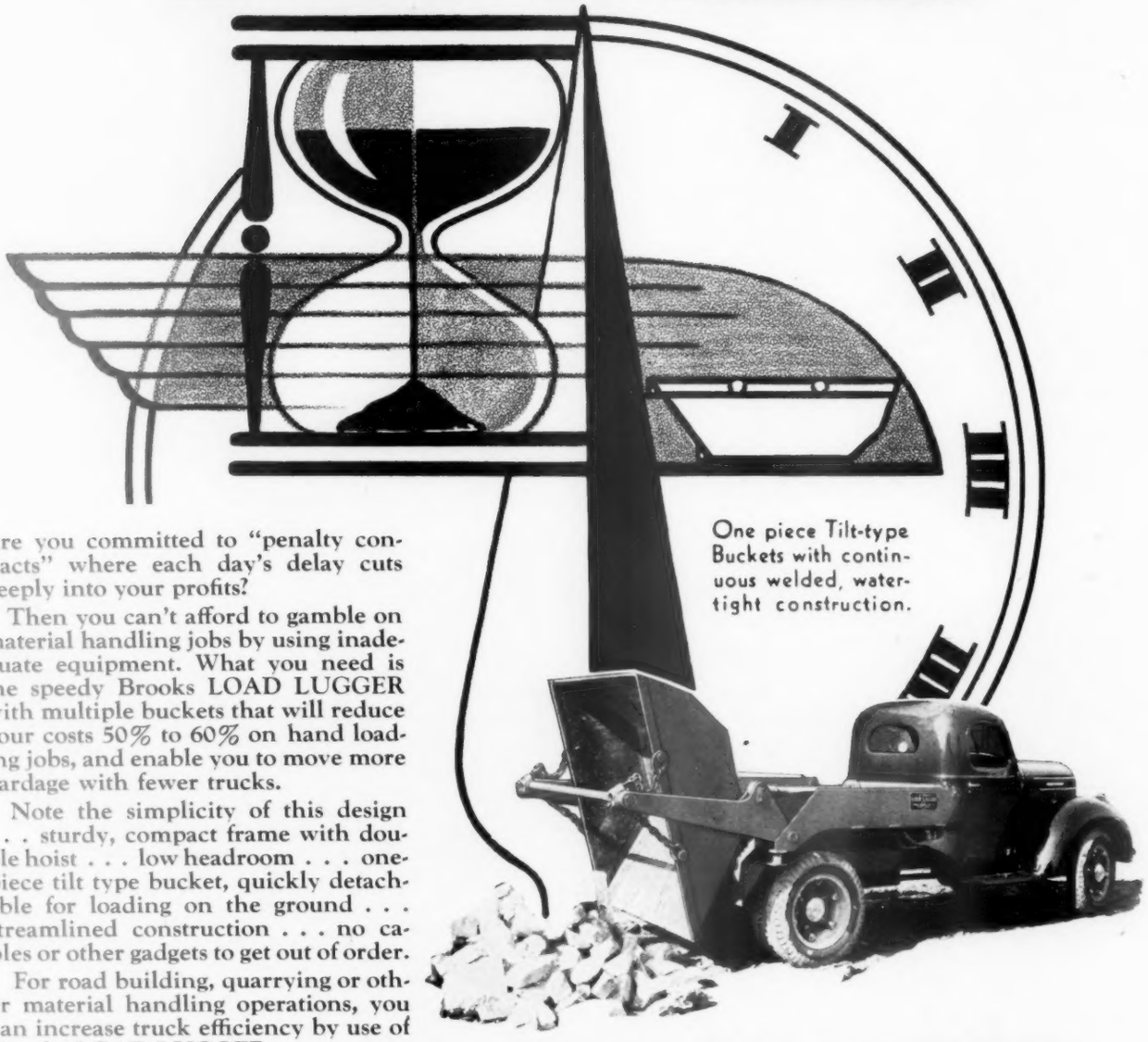
**GENERAL ELECTRIC**

750-37

# *Meet Your* TIME SCHEDULES *with*

# *Brooks* LOAD LUGGER

TRADE MARK REGISTERED



One piece Tilt-type Buckets with continuous welded, watertight construction.

Are you committed to "penalty contracts" where each day's delay cuts deeply into your profits?

Then you can't afford to gamble on material handling jobs by using inadequate equipment. What you need is the speedy Brooks LOAD LUGGER with multiple buckets that will reduce your costs 50% to 60% on hand loading jobs, and enable you to move more yardage with fewer trucks.

Note the simplicity of this design . . . sturdy, compact frame with double hoist . . . low headroom . . . one-piece tilt type bucket, quickly detachable for loading on the ground . . . streamlined construction . . . no cables or other gadgets to get out of order.

For road building, quarrying or other material handling operations, you can increase truck efficiency by use of Brooks LOAD LUGGER.

Ask about our Special Introductory Offer, enabling you to try out the Load Lugger on the job for two weeks.

## TIME-SAVING ADVANTAGES

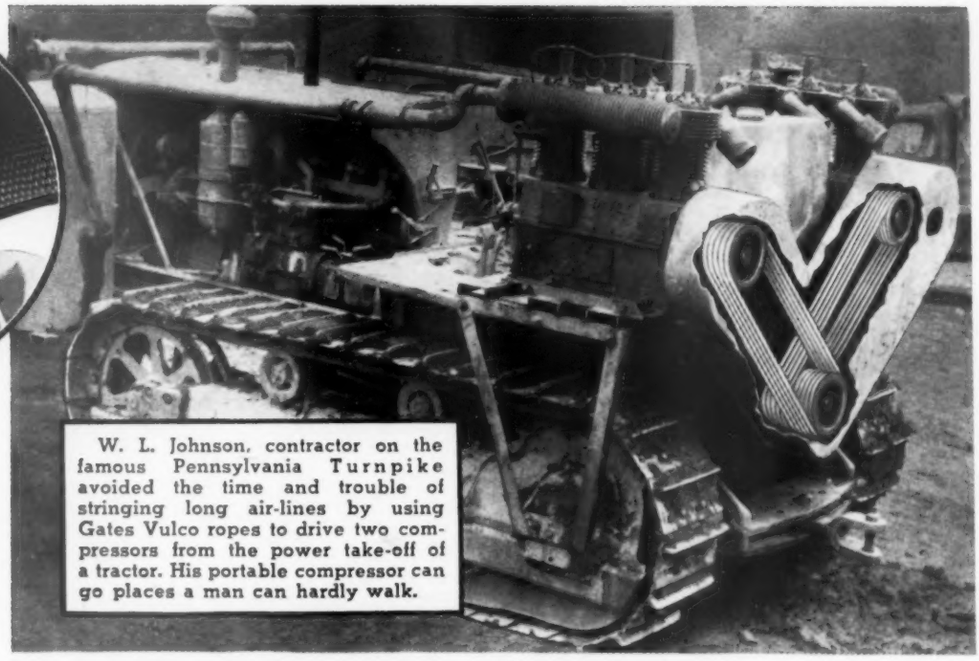
Only about 15 seconds to pick up or dump the loaded bucket.

Complete one-man control of hoisting and dumping from driver's cab.

*Distributors in all Principal Cities*

*Brooks* **EQUIPMENT AND MFG. CO.**

**103 Davenport Road** **Knoxville, Tennessee**



W. L. Johnson, contractor on the famous Pennsylvania Turnpike avoided the time and trouble of stringing long air-lines by using Gates Vulco ropes to drive two compressors from the power take-off of a tractor. His portable compressor can go places a man can hardly walk.

## Here's an Easy Way to *See for* YOURSELF

# HOW THE CONCAVE SIDE *Saves Money!*

**What Happens When a V-Belt Bends**

FIG. 1

FIG. 2

If you use V-belts you cannot spend two minutes more profitably than in making this simple test:—

Pick up *any* V-belt that is built with *straight* sides. Bend it as it bends in going around a pulley. You will see that the top of the belt grows *narrower,* the bottom *wider*—and the sides of the belt *bulge out.* The straight-sided belt, when bent, takes the shape shown in figure 1, at left. Clearly, this shape does not fit the sheave groove.

Now make the same test with the belt that is built with the patented concave side. As this belt bends, you will see it take the shape shown in figure 2—a shape that precisely fits the sheave groove.

Two savings result. First, no outbulge of the sides means uniform sidewall wear—longer life for the belt. Second, the full side of the belt uniformly gripping the sheave wall will carry heavier loads without belt slippage—a saving in belt wear and also in power!

The Gates Vulco Rope is the only V-belt built with the patented concave side.

## THE GATES RUBBER COMPANY

*Engineering Offices and Stocks in All Large Industrial Centers*

# GATES VULCO ROPE DRIVES

**CHICAGO, ILL.** 1524 South Western Ave.
**HOBOKEN, N. J.** Terminal Building
**BIRMINGHAM, ALA.** 1631 1st Ave., South
**LOS ANGELES, CAL.** 2240 E. Washington Blvd.
**DENVER, COLO.** 999 South Broadway
**DALLAS, TEX.** 2213 Griffin Street
**PORTLAND, ORE.** 333 N. W. 5th Avenue
**SAN FRANCISCO, CAL.** 2700 16th Street

Bank of 36 Buell (van Tongeren) Cyclones for Dewey Portland Cement Co., Davenport, Ia. Photo shows units assembled in shop and matchmarked before shipment, to expedite erection in the field

*still another*

# BUELL INSTALLATION FOR THE ROCK PRODUCTS INDUSTRY

Again this month, another new name—Dewey Portland Cement Co., of Davenport, Iowa—is added to the already long and distinguished list of Buell clients. All across America, the leaders in the rock products industry are depending more and more on Buell (van Tongeren) Collectors for service in conjunction with cement kilns, lime kilns, dryers, coolers, etc.

The reason for this wide reliance on dependable Buell equipment is as simple as

**A**—*Low Initial Cost*
**B**—*High Efficiency*
**C**—*Low Operating Cost*

Send for "DUST IN INDUSTRY" Buell's new 24-page book of facts.

BUELL ENGINEERING COMPANY, Inc.
Suite 5000, 12 Cedar Street, New York

buell
DUST COLLECTORS

Nation-wide service through offices of either Buell Engineering Co. or B. F. Sturtevant Co.

# It Has Everything In Its Class "Skinned A Mile"!

| | Vacuum Control | Ind. Chain Crowd | 175 F.P.M. Min. Hoist Speed | Tubular Dipper Stick | Shatter-Proof Glass | Max. Digging Radius 23' 2" | Max. Dump Height 17' 4" | Safety Power Drum Brakes | Min. 5.25 R.P.M. Swing | 2.25 M.P.H. Top Travel Speed | Simultaneous Swing, Hoist, Travel | 4 Anti-F. Bearinged Hook Rollers | A.F. Bearinged Main Mchy. Shafts | Min. 18" Crawler Treads | Min. 10'-3"+ Crawler Length | Ample Work Space in Cab | Power Boom Hoist and Safety Brake | Flame Hardened Gears | Automatic Swing Brake | Over 12"+ Ground Clearance | Gear Universal Power Hook-Up | Vacuum Power Trip | Over 57 H.P. Rating | Weight over 27,000 lbs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clipper Model 50 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Shovel No. 2 | No | No | Yes | No | No | No | No | No | No | No | No | Yes | Yes | Yes | No | Yes | No | No | Yes | Yes | No | Yes | Yes | |
| Shovel No. 3 | No | No | No | No | No | Yes | No | No | No | No | Yes | No | No | Yes | Yes | No | Yes | No | Yes | No | No | No | No | Yes |
| Shovel No. 4 | No | Yes | No | No | Yes | Yes | Yes | No | Yes | Yes | No | No | No | No | Yes | No | No | No | Yes | No | No | No | No | Yes |
| Shovel No. 5 | No | Yes | No | No | No | Yes | Yes | No | Yes | No | No | No | Yes | Yes | Yes | Yes | No | No | No | Yes | No | No | No | No |
| Shovel No. 6 | No | Yes | Yes | No | No | Yes | Yes | No | Yes | No | Yes | No | Yes | Yes | No | Yes | Yes | No | No | Yes | No | No | No | Yes |
| Shovel No. 7 | No | Yes | Yes | Yes | No | Yes | Yes | No | Yes | Yes | No | No | Yes | No | No | No | No | No | No | Yes | No | No | No | No |
| Shovel No. 8 | No | Yes | Yes | No | No | Yes | Yes | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | No | No | No | No | No | Yes |
| Shovel No. 9 | No | No | Yes | No | No | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | No | Yes | No | No | Yes | Yes |
| Shovel No. 10 | No | No | Yes | Yes | Yes | Yes | No | No | No | No | No | No | Yes | No | No | Yes | No | No | No | No | No | No | Yes | |
| Shovel No. 11 | No | Yes | No | No | Yes | Yes | Yes | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No | No | Yes | Yes |
| Shovel No. 12 | No | Yes | Yes | No | Yes | Yes | No | No | No | No | No | No | No | Yes | Yes | Yes | Yes | No | No | No | No | No | Yes | Yes |

Model 50 Clipper strips, digs and loads faster for the Corinth Sand & Gravel Co., Corinth, N. Y.

## Only Buckeye Clippers Have ALL 24 Features Preferred by Operators

Some shovels give you certain features at the expense of others, but Clippers give you all 24 operating and construction advantages that every operator wants in the shovel he buys—that's why the swing is to Clippers!

These 24 preference points add up to faster dig, hoist and swing; greater yardage at lower cost per yard and far lower maintenance costs.

Smooth, effortless Mevac (the original) Vacuum Power Control is reason enough for choosing a Clipper—for other exclusive features not common to other shovels, CHECK BUCKEYE FIRST!

Three rugged models, 'way ahead in every detail—

Model 50 ½ yd. ✓ Model 60 ⅝ yd. ✓ Model 70 ¾ yd. ✓

Quickly convertible to crane, trench hoe, dragline, pile driver.

BUCKEYE TRACTION DITCHER COMPANY
FINDLAY, OHIO

## Built by Buckeye ✓

Convertible Shovels

Trenchers

Tractor Equipment

R-B Finegraders

Road Wideners

Spreaders

# TELSMITH

## *flexibility*

## FITS THE PLANT TO ITS MARKET

● Faced with a diminishing deposit, the Kelly Run Stone Co. decided early in 1938 not only to open a new quarry higher on South Mountain but to erect a completely new 125-150-ton-per-hr. rock crushing plant about six miles southeast of Wilkes-Barre, Pa.

Their well established market demanded products to suit widely varying specifications. This called for a plant of extreme flexibility. They have just that. Its design and construction was supervised by their Gen. Mgr., B. C. Banks, with Telsmith's engineering co-operation.

In large part this plant's flexibility is due to its Telsmith equipment. The 72" x 25' Telsmith Roller Bearing Rotary Scalping Screen insures quality grading and cleanliness. Plus 4" rock or tailings from scalper are chuted to the 13-B Telsmith Gyratory Secondary Crusher (Fig. 1) and its product in turn goes back to the scalper. Thus either ballast or modified base coarse stone may be produced in the scalping bin and trucked from there. The "parallel pinch" of the Telsmith Gyratory quickly reduces large pieces at top of bowl. Operating at an eccentric speed of about 220 rpm, its capacity is high. And its super-strong steel frame and crown and unbreakable shaft insure continuous output.

A No. 36 Telsmith Gyrasphere Crusher (Fig. 2) serves as a finishing crusher, taking raw feed from scalping bin, also tailings and unwanted sizes from main bin. By varying percentage of feed and crusher's settings, proportions are controlled and various sizes in the amounts needed are produced.

Four finishing screens produce a total of 6 possible sizes, in addition to dust—two 4'x10' Telsmith Double Deck Pulsators delivering 3 sizes to main bin compartments on one side of elevator, and two other screens delivering to other side.

Do you want flexibility in your plant, with low-cost operation and maintenance? Write for Bulletin Q-15.

1

2

Q-5

SMITH ENGINEERING WORKS, 504 EAST CAPITOL DRIVE, MILWAUKEE, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

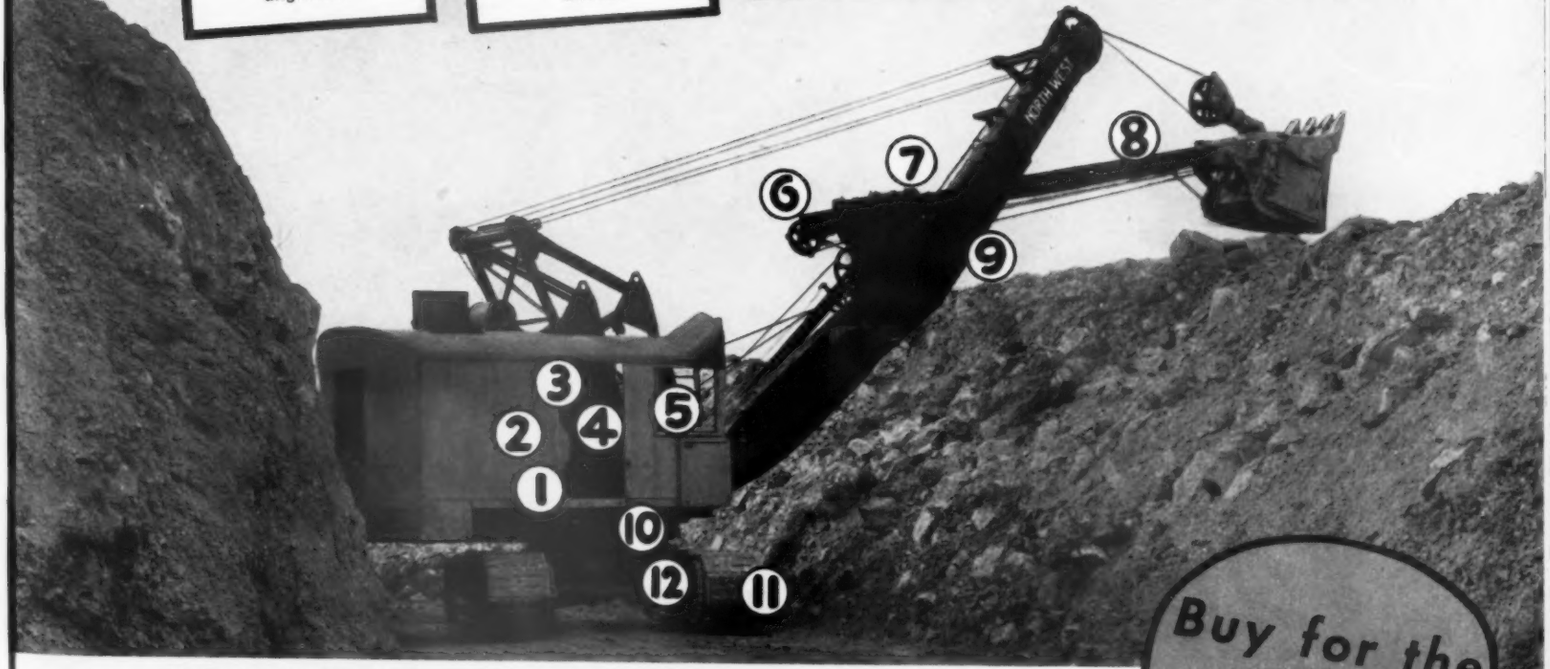
50 Church St. New York City | 211 W. Wacker Drive Chicago, Ill. | 713 Commercial Trust Bldg. Philadelphia, Pa. | 81 Binney St. Cambridge, Mass. | Vern Wheeler Eqpt. Co. Columbus, Ohio | Brandeis M. & S. Co. Louisville, Ky.

Charleston Trac. & Eqpt. Corp. Charleston, W. Va. | Roanoke Trac. & Eqpt. Co. Roanoke, Va. | North Carolina Equip. Co. Raleigh and Stateville, N. C. | Wilson-Weesner-Wilkinson Co. Knoxville and Nashville, Tenn. | United Steel Sales Toronto, Ont.

# Count 'em-13 Reasons

## why your next shovel should be a NORTHWEST

1. The Helical Gear Drive mounted on ball or roller bearings fully enclosed and running in oil — quiet, smooth, trouble free!
2. Uniform Pressure Swing Clutches. Large and ventilated with double cone shaped block frictions, no jerks, no grabs — far superior to a band type clutch which can not possibly be uniform in pressure.
3. Ball or Roller Bearings on all High Speed Shafts.
4. The "feather touch" Clutch Control in the main drum clutches — easy operation without complications. No piping, nothing to refill — not affected by weather.
5. The Cushion Clutch reduces the overloads on all parts under power when shock loads are encountered. It reduces wear and tear and lengthens cable life.
6. Dipper sticks are tied together by a cap casting and work as a unit.
7. Dual Independent Crowd utilizes force other shovels waste (Ask for "Digging Power Plus")
8. Long reach and positive independent control of the dipper.
9. The Northwest Welded Boom (hundreds in service and no Northwest Welded Boom has ever failed)
10. Cast Steel Bases give a rigid foundation that maintains shaft alignment
11. Differential Steering — positive traction on *both* crawlers while turning as well as when going straight ahead.
12. Travel gears fully enclosed and running in oil.
13. And many other features that mean high output and low maintenance.

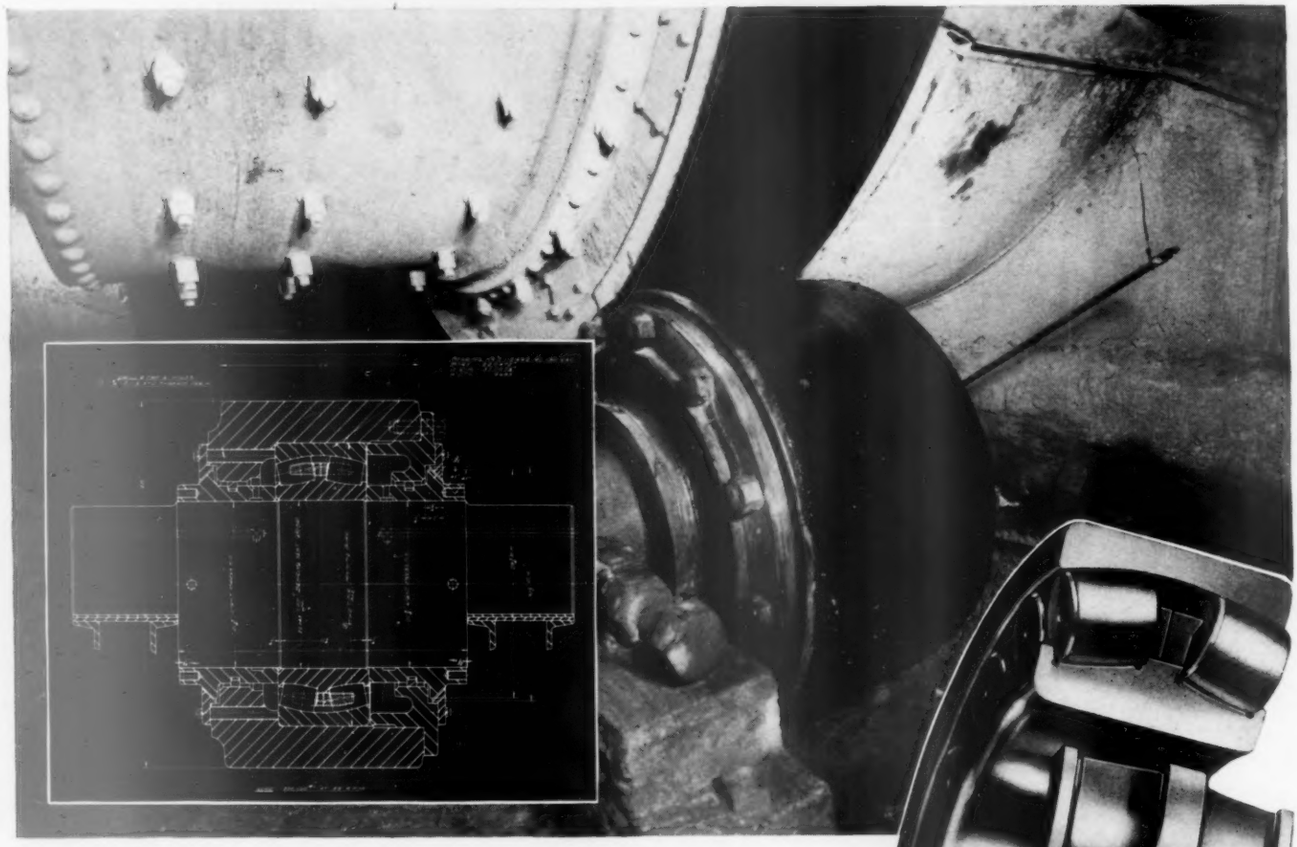



**NORTHWEST ENGINEERING COMPANY**
1822 Steger Building · 28 East Jackson Boulevard · Chicago, Illinois

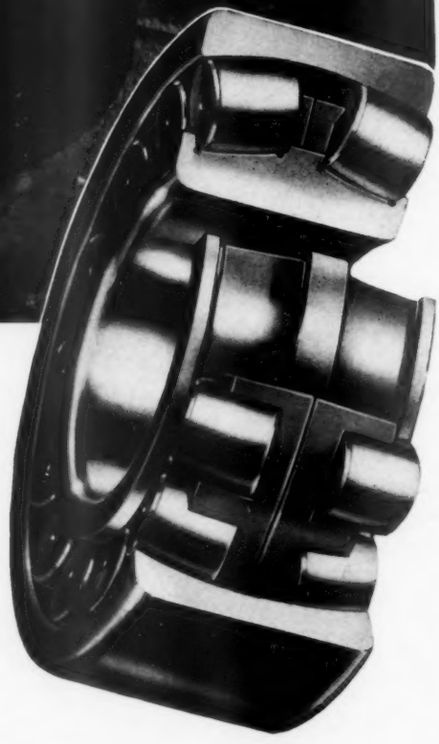
# NORTHWEST

*Shovels • Cranes • Draglines • Pullshovels*

**Buy for the tough jobs and the easy jobs take care of themselves**



*Trunnion roller, built by Alliance Machine Co., on giant Allis-Chalmers Compeb Mill installed at West Penn Cement Co., West Winfield, Pa.*



# 100 Tons

# ON ONE SKF BEARING

It takes a TOUGH bearing to support 100 tons at 55 r.p.m. inside this 48″ x 26″ trunnion roller . . . and to do it *every* day for years without trouble. And on this roller, it took an SKF Spherical Bearing that not only assures full contact between rollers and tires, but does away with the misalignment that causes thrust, tire wear, and flat spots. Always there's quiet operation . . . DEPENDABLE performance. Submit *your* designs for proposal.

SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILA., PA.

4746-B

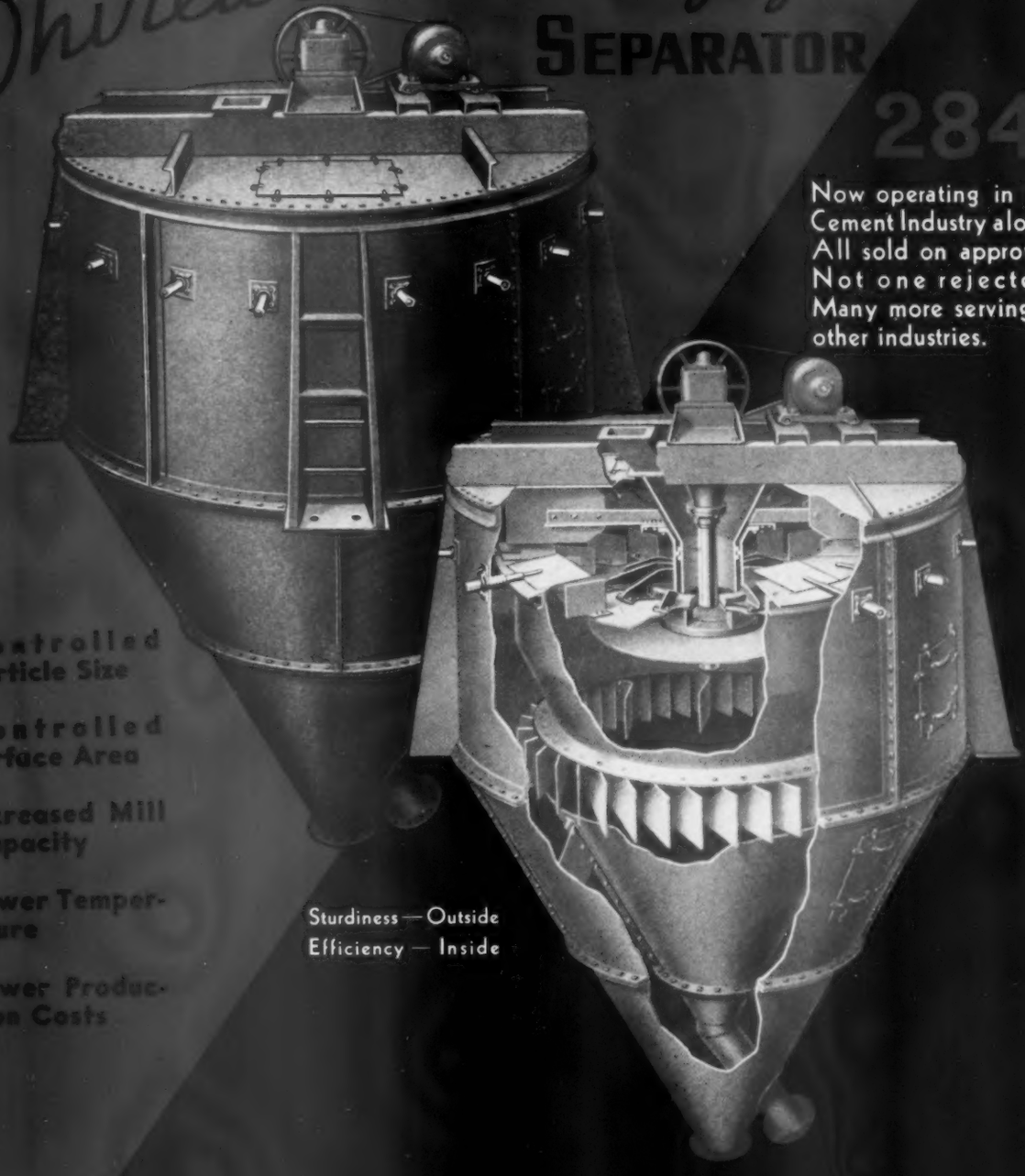
**ROLLER SKF BEARINGS**

# STURTEVANT

## Whirlwind Centrifugal SEPARATOR

284

Now operating in the Cement Industry alone. All sold on approval. Not one rejected. Many more serving in other industries.



- Controlled Particle Size
- Controlled Surface Area
- Increased Mill Capacity
- Lower Temperature
- Lower Production Costs

Sturdiness — Outside
Efficiency — Inside

OTHER STURTEVANT PRODUCTS

Jaw Crushers | Rotary Fine Crushers | Crushing Rolls | Ring-Roll Mills | Moto-Vibro Screens | Swing-Sledge Mills

STURTEVANT MILL CO. HARRISON SQUARE BOSTON, MASS.

# *In these days . . .*

## would you try a twist drill with 50% longer life?

Surely in these critical days you would try a different drill if you could be sure it would last 25% or even 10% longer. And you would apply the same logic to wire rope if you knew that there is really a difference in ropes. There is, and the name of the rope to ask for is

**HAZARD LAY-SET *Preformed***

In comparison with non-preformed ropes, LAY-SET Preformed often makes astonishing records.

In the first place, it *lasts longer* because of its extreme resistance to fatigue. That eliminates frequent shutdowns for replacement, thus saving priceless time. This means faster and more consistent production.

In the second place, it is *easier and safer for workmen* to handle. It is disinclined to kink. It's relaxed and tractable like a well-trained saddle horse as compared with a bucking bronco.

These characteristics are preformed into LAY-SET Wire Rope at the mill, and they account for its ability to withstand hard work for a longer time at a lower cost—and with greater safety to men and equipment.

See for yourself by ordering Hazard LAY-SET Preformed Green Strand and keeping a comparative record of its performance. All Hazard ropes identified by the Green Strand are made of Improved Plow Steel.

**HAZARD WIRE ROPE DIVISION** • WILKES-BARRE, PENNSYLVANIA

*Established 1846*

**AMERICAN CHAIN & CABLE COMPANY, Inc.**

District Offices: New York, Chicago, Philadelphia, Pittsburgh, Fort Worth, San Francisco, Denver, Los Angeles, Atlanta, Tacoma

# 4 Significant Jobs

Job No. 2—Helen, Ga.

Job No. 4—Kansas City, Mo.

Job No. 1
Lawrenceburg, Ky.
Not shown here.

Job No. 3—Aurora, W. Va.

IN 1940 Barber-Greene Mixers were set up for the "high type hot mixes" on four widely separated locations. They herald a new era in bituminous construction. The performance data and laboratory reports have been assembled into a booklet, available on request. Not a picture book, it gives the *results* of applying the modern production principle of continuous flow to the "high type hot mixes". It will answer the questions of those who are *sincerely skeptical.*

The B-G Central Plant includes the Dryer, Gradation Control Unit (Screen, Bins, Apron Feeder, and Calibrated Gates), and Mixer. It gives the finest means of preparing the "high type hot mixes". By "finest" we mean from every angle, including accuracy, consistency, ease of inspection, high capacity, portability, versatility, and economy.

The units can be used in any desired combination, including Single Aggregate Central Set-ups, and Travel Plant work.

It will not be surprising if the introduction of the continuous plant on "all type" mixes is opposed — by some wanting only complete proof and demonstration — by others who have financial or other interests in less portable, less versatile, or less modern equipment. We conscientiously believe that these groups will serve their own interests by studying the booklet. Already some producers have expressed interest in supplementing their present permanent equipment with a portable continuous plant, in order to more economically supply the more distant areas of their present markets.

**Write for your copy.**

1-41

**BARBER-GREENE**
STANDARDIZED MATERIAL HANDLING MACHINES
AURORA ILLINOIS

- **Complete, accurate and up-to-the-minute Directory.**
- **Hundreds of new names; others checked and revised.**
- **Alphabetical by companies; geographical by plants.**
- **Consolidated catalogs of equipment makers.**
- **Revised and improved technical section.**

# NOW READY! . . . YOUR 1941 MAILING LIST . . . ORDER IT TODAY

## Don't Waste Your Time and Postage on an Old List

The compilers of the 1941 Directory Section of Pit and Quarry Handbook have labored painstakingly to build an accurate list of all known American producers of nonmetallic minerals. Each new listing has been carefully scrutinized for accuracy and completeness. Previous listings have been revised, checked, double-checked. All appear two ways—(1) alphabetical by companies, (2) geographical by plants. It gives you company names, officers, location of plants, size or capacity, and names of the men who do the buying. Select the complete Handbook and Directory, or the convenient, flexibly-bound Directory alone. Now ready for distribution. Order NOW to insure getting one of the first copies. Use coupon below . . . we'll bill you after you get the book.

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Please send.....copies of the 1941 HANDBOOK ($10.00 per copy)

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☐ Check enclosed.....

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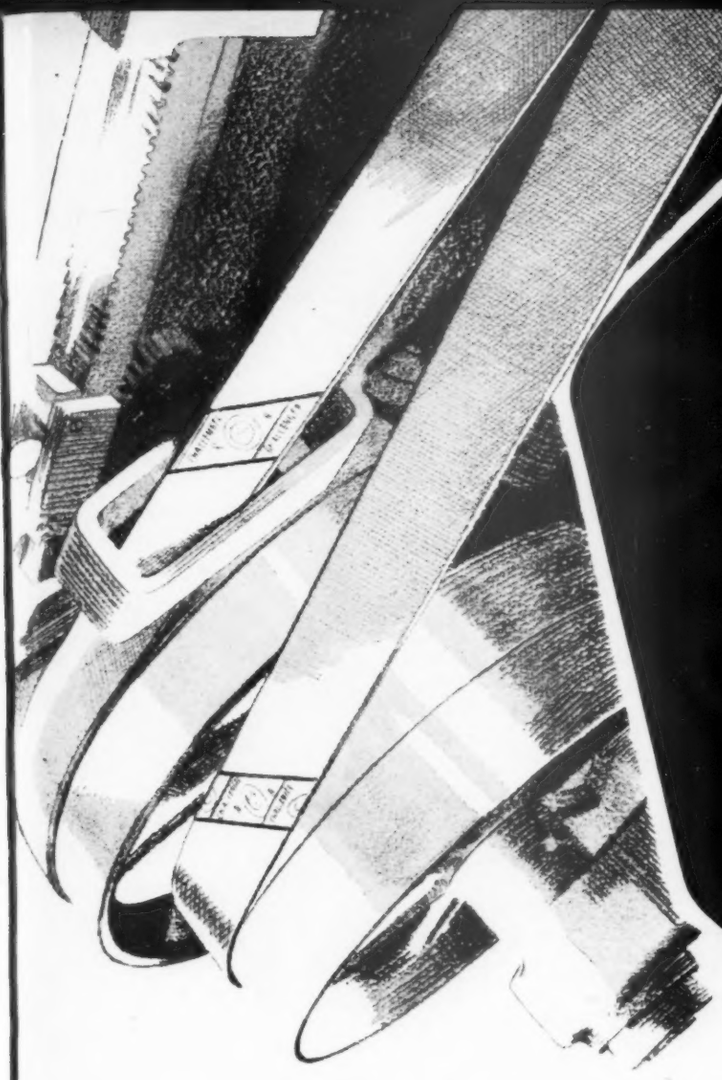
Name ..... Title.....

Company .....

Town ..... State.....



# CHALLENGER TRANSMISSION BELTING

## TO HELP YOU LICK PRODUCTION DELAYS

*The* capacity of Republic's Challenger Transmission Belting for record-breaking service has won for it the first preference of countless leading industrial plants. Immediate availability is provided by one of the most efficient industrial supply systems in the country . . . represented locally by your Republic Distributor. This belt quality plus highly geared organization for rapid service is more important to industry today than ever before. It provides the swiftest, most effective means for avoiding interrupted power transmission and subsequent production delay in your own plant. REPUBLIC RUBBER DIVISION OF LEE RUBBER AND TIRE CORPORATION, YOUNGSTOWN, OHIO.

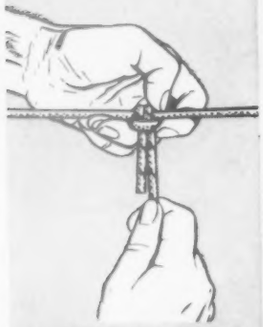
**ORDER REPUBLIC PRODUCTS FROM YOUR DISTRIBUTOR**

# REPUBLIC RUBBER

LEADERSHIP IN POLICY PRODUCT AND PERFORMANCE

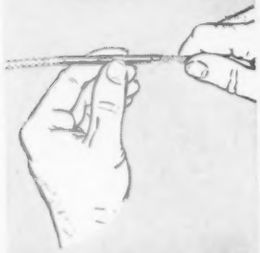
HOSE • BELTING • PACKING • MOLDED PRODUCTS

1. Tie through cartridge.



2. Half hitch branch to main line.

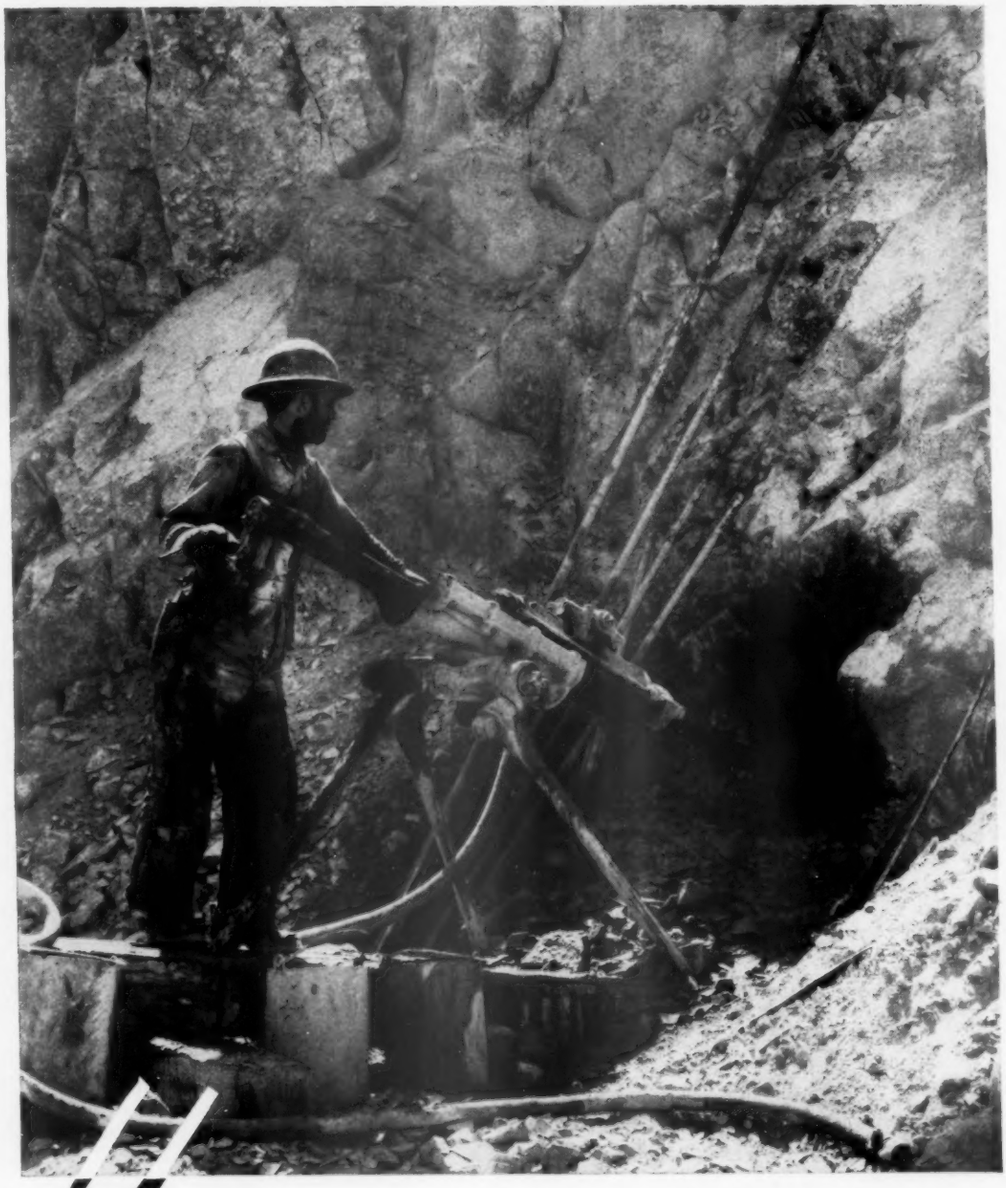
3. Connect main line lengths with *square* knot.



4. Fuse and cap on end of main line.

**IMPORTANT**

**Branch lines should lead away from main lines at *right angles*. Avoid kinks and small loops.**



# *Yes, for small holes, too*

Primacord will save you money. This lightweight, waterproof, flexible detonating fuse acts as the detonating agent for each cartridge in the drill hole, and connects all holes. One fuse and cap or electric blasting cap attached to the end of the main line detonates the entire blast. Because of the special construction of Primacord, it is possible to detonate holes placed at very close intervals, without danger of cut-offs. Write for the Primacord book.

**PRIMACORD BICKFORD**
**Detonating Fuse**

PB-30

**THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.**

*Makers of Cordeau-Bickford Detonating Fuse — and Safety Fuse since 1836*

# How to cut rope costs . . .

ROEBLING

"BLUE CENTER"

WIRE ROPE

PREFORMED OR STANDARD

Through years of planned research and development, we have continually improved the endurance of Roebling "Blue Center" Wire Rope. Today, as a result, "Blue Center"—Roebling's highest achievement in wire rope manufacture—enables you to keep your wire rope replacements at an all-time "low".

There are other important reasons for the long life and economy of "Blue Center". For example—Roebling's control of every manufacturing process from raw material to final inspection, and exceptional testing facilities.

Companies that keep accurate records report that Roebling "Blue Center" gives them lowest rope replacement cost. Therefore, we say with assurance—put Roebling "Blue Center" to the severest test—on any of your rope-rigged equipment. We are confident of the results!



## CLOSE CONTROL OF WIRE ROPE QUALITY

When it comes to making Roebling "Blue Center"—a wire rope of exceptionally great strength and stamina—ordinary production methods won't do. Painstaking care and skill of the highest order must be exercised.

Typical of this care is the close control of quality in making Roebling "Blue Center" Wire Rope—control from steel production to finished product.


JOHN A. ROEBLING'S SONS COMPANY

Trenton, N.J.

Branches in Principal Cities

Export Division: 19 Rector Street

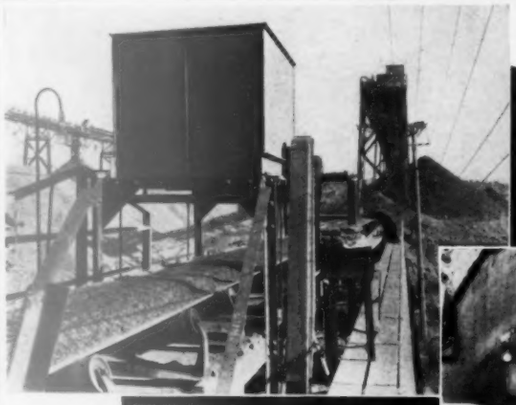
New York, N.Y., U.S.A.

Cable Address: "Roebling's"

New York


ROEBLING 1841 100th ANNIVERSARY

JOHN A. ROEBLING'S SONS COMPANY



Merrick Weightometer with Rateograph to weigh finished sand as shipped

MERRICK Equipment at Shasta Dam

One of 3 Merrick Feedoweights for blending sand fractions to finished sand belt conveyor

## 4 Merrick Weightometers and Rateographs . . .

are used by the Columbia Construction Company for important weighing operations in supplying eleven million tons of sand and gravel for the building of Shasta Dam.

Merrick Weightometers weigh and register

- raw material entering the plant
- material going to grinding mill
- blended sand for delivery to dam
- and all aggregate sent to dam on the 9.6 mile conveying system.

Merrick Feedoweights are used to blend sand fractions from stockpile to finished sand belt conveyor. All this equipment contributes to the speed and efficiency of the operation.

*Write for information*

MERRICK SCALE MFG. CO., PASSAIC, N. J.

# DEMPSTER DUMPSTER

## THE ORIGINAL BUCKETRUX

The New Model AP (Automatic Pickup) DEMPSTER-DUMPSTER leads again in the latest development in the detachable bucketrux field. A forked lift eliminates the lifting chains on the buckets. Pickup, carrying, dumping and return are speeded up, bringing even greater efficiency and lower cost to this modern hauling method. DEMPSTER-DUMPSTERS are supplied in sizes ranging from 1½ to 6 cubic yards . . . capacities 4,500 to 12,000 lbs. pay-load . . . in Drop-Bottom, Skip Type, Tilt Type and enclosed Buckets.

Skip Type Container in carrying position.

Drop-Bottom Bucket in dumping position.

***Investigate . . . Check with the Operators Who Use Them . . . Write for Details of Our Trial Offer***

DEMPSTER BROTHERS, Inc. KNOXVILLE, TENNESSEE

**BUILT FOR ANY PRESSURE TO 125-LB.**

Hundreds of Fuller Rotary Compressors are in operation, giving owner satisfaction at exceedingly low operating expense. That's what plant superintendents and maintenance men like about them . . . on the job day after day, month in and month out, with practically no attention whatsoever. It's to your advantage to take time out to become better acquainted with these most modern, efficient units for gas or air compression.

**PIONEERS IN HIGH-EFFICIENCY ROTARY COMPRESSORS**

Fuller

FULLER COMPANY
CATASAUQUA, PENNA.
Chicago: 1118 Marquette Bldg.
San Francisco: 320-321 Chancery Bldg.

C-53

# SAFE

## where others fear to tread

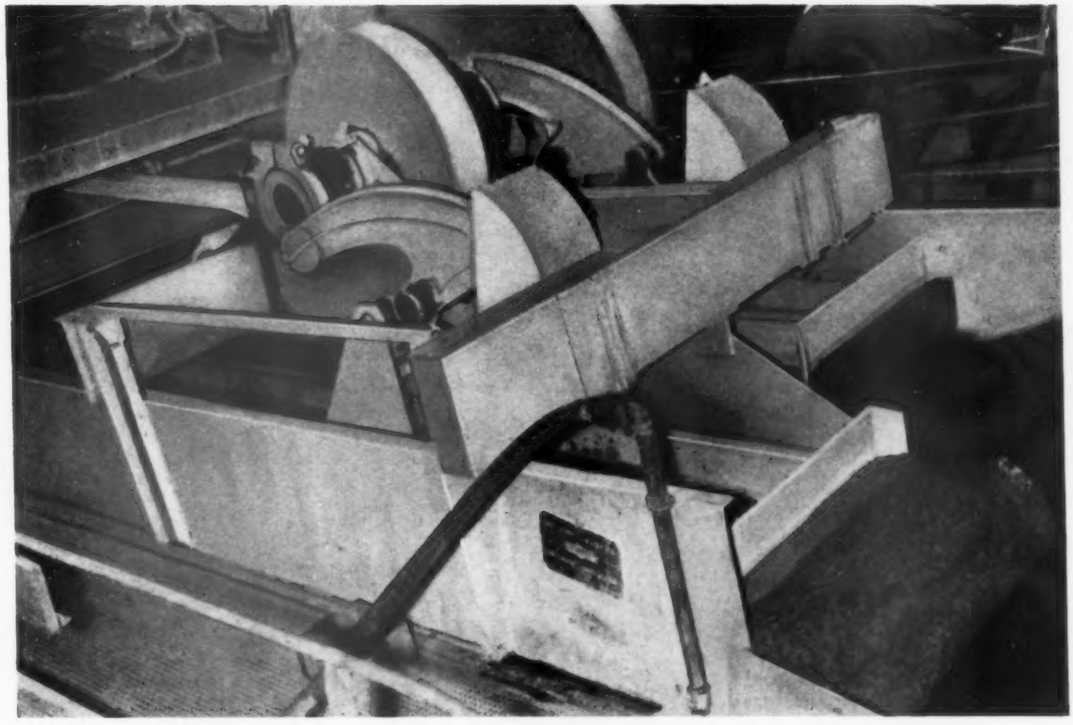
Bucyrus-Monighans walk surely . . . over rough ground or soft. They side-step obstacles, waste no time getting from one digging position to the next. They can work close to the edge of the bank, with consequent increase in effective range. They walk "softly," cushioning down with an ease that means long life. Because of the exclusive "Rolling Cam," they walk efficiently throughout millions of yards of tough digging. Performance has made them the most popular draglines in the world. They are available with booms up to 250 feet and buckets up to 20 yards.

Sold by

**Bucyrus·Erie**

SOUTH MILWAUKEE, WISCONSIN

# FOR COMMERCIAL SAND PRODUCERS



*Dorr Classifier discharging a washed and graded sand fraction ahead of stock piles and blending plant.*

## "Prescription Sand" OF SHASTA DAM QUALITY

FIRST BOULDER DAM—then Grand Coulee—now Shasta. Three great Federal Reclamation Bureau projects, requiring top specification concrete sand, cut to measure by Dorr Systems.

Sand for Shasta's 6,000,000 cu. yards of concrete is being supplied at the rate of 2,000 tons per hour by two Dorr Hydro-separators followed by three Dorr FX Classifiers. The three sand fractions (see box at left) are blended to yield a final product of the desired gradation, equivalent to a fineness modulus of 2.73.

SHASTA DAM FRACTIONATION & BLENDING STANDARDS

Three Graded Fractions

No. 1 Dorr Classifier—No. 4 + No. 28 screen—coarse
No. 2 Dorr Classifier—No. 28 + No. 40 screen—medium
No. 3 Dorr Classifier—No. 40 + No. 100 screen—fine

One Composite Blend

| Retained on Sieve | Percent Cumulative |
|---|---|
| No. 4 | 3 |
| No. 8 | 15 |
| No. 14 | 30 |
| No. 28 | 55 |
| No. 48 | 77 |
| No. 100 | 93 |

Fineness Modulus 2.73

The use of the Dorr System is by no means limited to big projects of Boulder, Grand Coulee and Shasta calibre. Commercial sand and gravel operations as small as 50 tons an hour can obtain the same high standards of performance using smaller Dorr units especially designed for this purpose.

*"Making Prescription Sand at 50 tons an Hour," available on request, contains full information on a successful commercial adaptation of Grand Coulee and Shasta Dam practices.*

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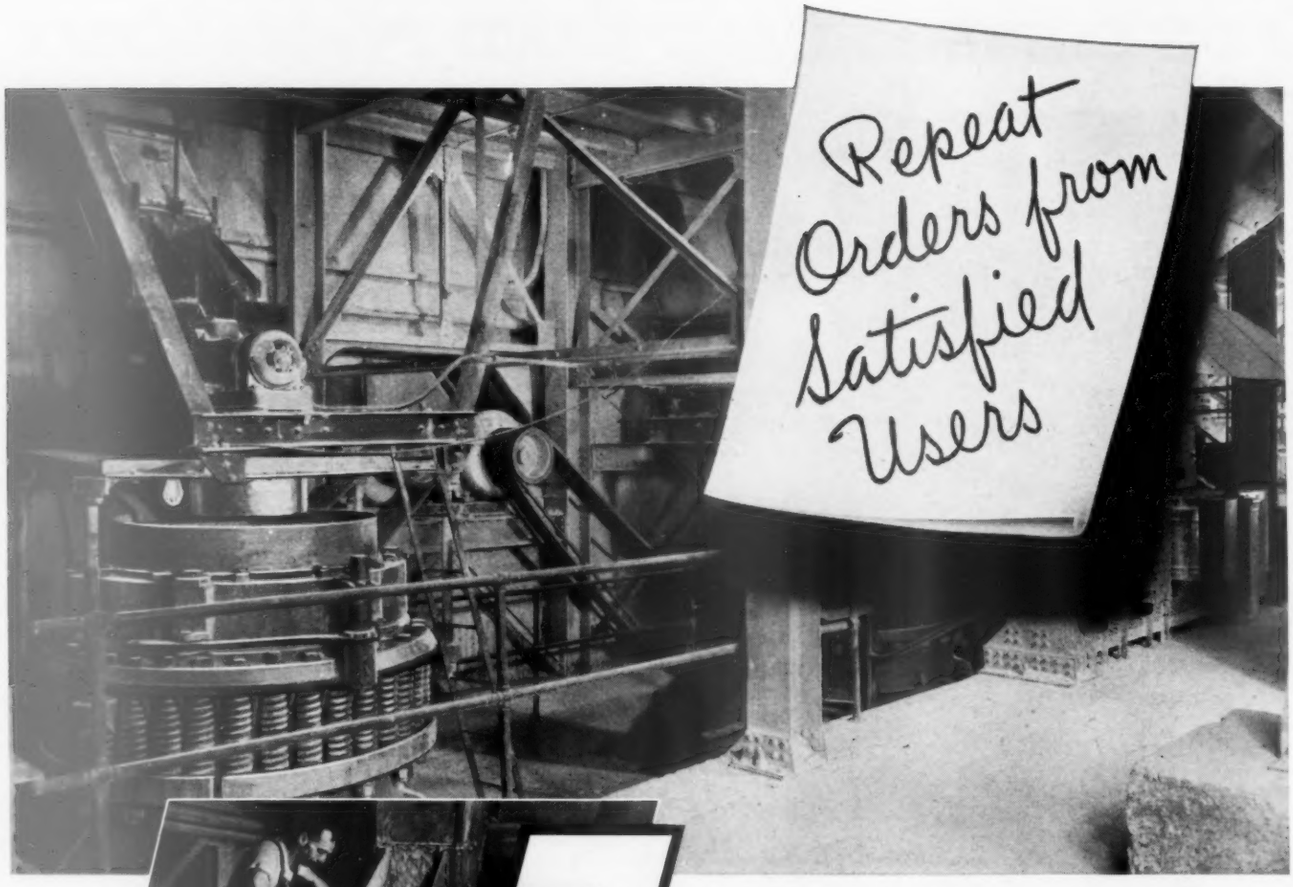


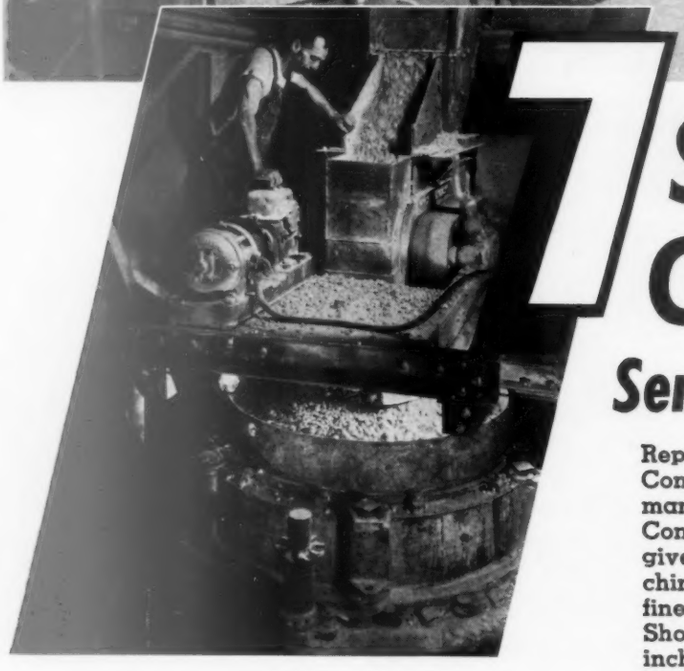

# 7 SYMONS CONE CRUSHERS . . .

## Serve this Stone Producer!

Repeat orders are common among users of Symons Cone Crushers. Basic Dolomite, Inc., is one of the many larger producers who has continued to order Cones because of the satisfactory performance given by the original installation. The seven machines used by this company, which take care of the fine crushing operations, include both Standard and Short Head Types and range in size from 20 to 48 inches. Another prominent producer of aggregate has twenty-seven Symons Cones in service. It is the installation of this modern reduction crusher that has enabled many plants to maintain production in face of changing material specifications and at a crushing cost which assures of increased profits.

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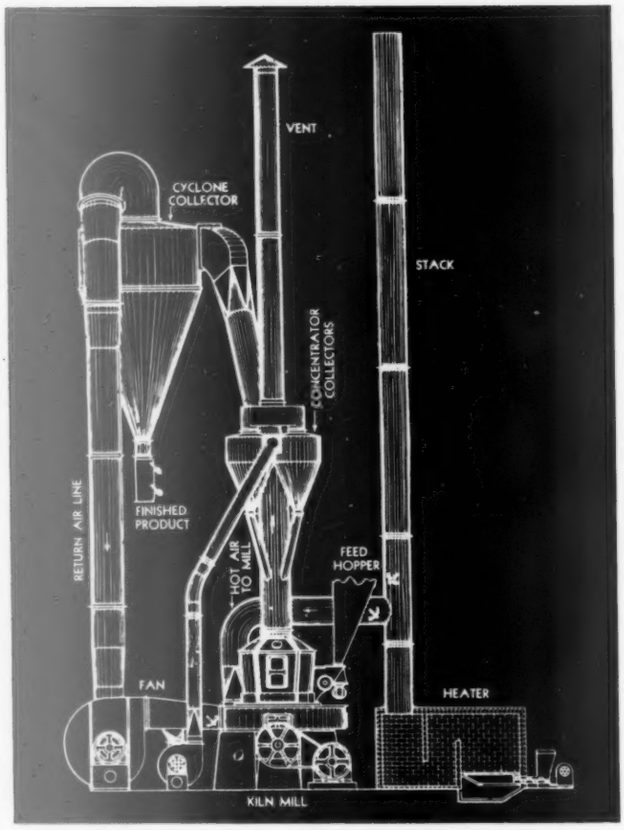
## 11 Tons Per Hour...

### DRIED and GROUND

### *by the Raymond*

### —LOW SIDE—

## ROLLER MILL




**Flow Sheet of Operation**

*Diagram of Low Side Roller Mill with heater for drying system; also piping and collectors for the air separation and conveying system.*

**In this operation, a controlled supply of heated air is introduced into the mill system for removing approximately 3% of surface moisture from the gypsum while pulverizing.**

**The resultant product is a fine, dry, free-flowing material. By this method, it is possible to obtain the proper uniformity and other desirable characteristics in the finished product. The drying action makes the material easier to grind, so that extra high capacities are obtained. At a fineness of 80% passing 100-mesh, the mill delivers 11 tons per hour, or 10 tons at 85% through the same mesh sieve.**

**The Raymond Low Side Roller Mill is economically adapted for grinding many other non-metallic minerals. It produces record high tonnages per horse-power for materials in an average fineness range of 60% to 95% passing 100-mesh, such as limestone, dolomite, phosphate rock, bentonite, clay, barytes and similar products.**

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# PIT AND QUARRY

Vol. 33 MARCH, 1941 No. 9


# CONTENTS


News of the Industry . . . . . 37

Bents Supporting 60-Foot Pipe Line Eliminated Through Use of Wire-Rope Tension Members . . . . . 42

Shortage of Fine Sand Fractions Necessitates Elaborate Grinding at Shasta Dam Plant 43

Economy Rules in Legislatures; What Various States Are Doing . . . . . 50

Producing Aggregates in Alaska . . . . . 52

Laws Pertaining to Sale Contracts . . . . . 54

Southwestern Is Making Improvements at Its Victorville and El Paso Plants . . . . . 56

Mining Engineers Seek to Standardize Nonmetallic-Minerals Specifications . . . . . 61

New Ideas, New Processes Discussed as Products Makers Meet in Chicago . . . . . 84

Sand Lime Brick Association Holds Interesting Meeting . . . . . 89

Cast-Stone Producers Attend Special Plant Demonstration . . . . . 90

Concrete-Pipe Manufacturers Hold Well-Attended Meeting . . . . . 92

Unusual Aggregates in Concrete Brick . . . . . 93

Utah Operator Supplying Large Pipe Sections for Deer Creek Aqueduct . . . . . 95

Weighing in the Nonmetallic-Minerals Industries . . . . . 99

Personal Mention . . . . . 65
Foreign Practice . . . . . 67
Labor Decisions . . . . . 69
Traffic News Digest . . . . . 72
New Machinery and Supplies . . . . . 74



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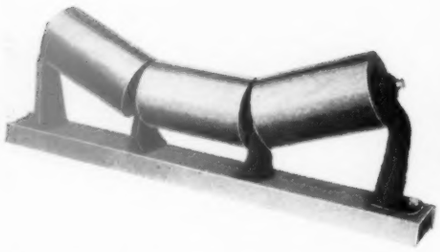

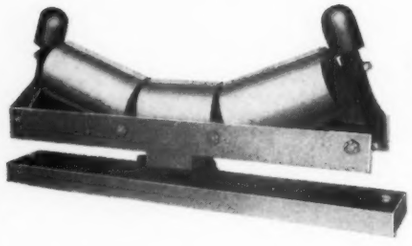

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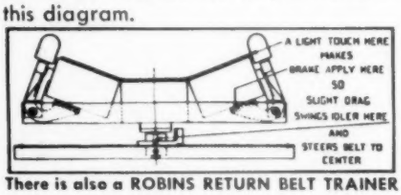


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PIT AND QUARRY

CHICAGO MARCH, 1941

## Permanente Prepares to Build Magnesium Plant at Los Altos

Work will be started shortly on a $12,000,000 magnesium plant to be built near Los Altos, California, by the Permanente Corporation for the construction of war materials and it should be in operation by the middle of July, according to E. E. Trefethen, vice-president.

The plant will be built adjacent to Permanente's $4.000,000 cement plant. It will be constructed so that both plants can use the same facilities. Natural gas will be used as a cooling agent in the magnesium reduction and will be burned for heat in the cement plant. Crushing equipment, yards, machine shops and other buildings will be used jointly.

In addition to the original $6,000,000 magnesium plant announced in reports from Washington, D. C., the corporation plans to erect an additional $5,000,000 factory for making magnesium metal parts.

Much of the ore to be handled by the new plant will come from Nevada. The Defense Commission already has issued a special tax privilege permit to allow the Permanente Corporation to deduct $6,500,000 of the cost of the plant from its taxable income over a five-year period.

## Harry Huffstetter Dies at Indianapolis Home

Harry C. Huffstetter, 80, president of the Brown-Huffstetter Material Company, Indianapolis sand producer, died recently in his home in Indianapolis. Mr. Huffstetter had lived in Indianapolis for the past 36 years and had always been vitally interested in the welfare of the community in which he lived.

Shortly after he moved to Indianapolis, Mr. Huffstetter helped organize the Indiana Sand & Gravel Producers Association and was the organization's first president. He was an active member in many other civic clubs, and was a York Rite Mason and a Shriner.

## Gypsum Plant Busy on Defense Orders

Rushed because of the national defense boom, the National Gypsum Company's plant at Portsmouth, New Hampshire, is now working 24 hours a day in an effort to fill orders for wall board to be used on defense projects.

Approximately 200 men are working three shifts in the factory, which is one of 16 scattered about the country.

## Lone Star Purchases British-Held Shares

The Lone Star Cement Corporation recently bought from British holders 21,657 shares of its stock for $831,087, Charles L. Hogan, president, has announced.

It is planned to recommend to stockholders at the annual meeting in May that these shares, plus 7,541 held in the treasury, be canceled and retired.

## Coming Events

*April 23-25, 1941—Hot Springs, Virginia.* Convention, Concrete Reinforcing Steel Institute, Homestead Hotel.

*May 27-29, 1941—Hot Springs, Virginia.* Annual convention, National Lime Association, Homestead Hotel.

*June 23-27, 1941—Chicago.* Annual meeting, American Society for Testing Materials, Palmer House.

## 5,000,000 Barrels of Cement Sought for Panama Canal

The Panama Canal purchasing office will ask for bids on 5,000,000 barrels of cement within 30 days, according to advice from Washington, D. C.

The cement will be used in the construction of a third set of locks at the Panama Canal.

Both eastern and western cement producers are expected to bid on the order.

One of the points yet to be cleared up is whether the Government would require the cement to be shipped in bulk or bags.

It is said the canal purchasing office may provide in its invitation to bid that successful bidders construct silos at the canal, where the cement can be stored.

## Curtis Honored for 25 Years P.C.A. Service

A. J. R. Curtis, assistant to general manager and secretary of the Committee on Accident Prevention and Insurance of the Portland Cement Association, completed 25 years in the service of the Association on January 8. At a luncheon in his honor on January 16 fellow employees presented him with a beautifully hand-lettered tribute, referring particularly to his outstanding leadership in the field of human conservation, in which endeavors the cement industry has acquired fame.

## 18 Pennsylvania Slate Companies Indicted

Eighteen Pennsylvania slate companies and 18 individuals were indicted on January 29 at Philadelphia by a federal grand jury on charges of violating the federal anti-trust laws by fixing prices.

## M. H. Kennelly Assails Politics in Business; Resigns Chairmanship

In a speech said to be startling for its frank discussion of political ramifications in the building-materials industry, a subject which politicians discuss only behind closed doors, Martin H. Kennelly, on February 4 resigned his $20,000 a year post as chairman of the executive board of the Consumers Company, Chicago aggregates producer and building-supplies firm.

Mr. Kennelly was one of five trustees appointed by Federal Judge James H. Wilkerson, when the Consumers Company was reorganized in 77-B bankruptcy proceedings. That was in 1937. During the intervening four years he has directed the operations of the huge concern. His resignation, prefaced by his frank talk, is reported to have come as a bombshell to the Chicago materials trade.

"I am stepping out of this company," Mr. Kennelly told the directors. "As I do so I am glad to be able to point to the fact that for the first time in years your company finished the year in the black. Its profit will be $60,000 compared with a loss of $114,000 in 1940. That is a source of gratification. But even greater gratification comes in the knowledge that for the last four years no politician's name has been on your pay rolls—no politician's name even spelled backwards.

"In the four years of our stewardship we have not solicited or accepted business on a political basis. It is a pleasure to report that we reached the stage of profitable operation without political manipulations."

The significance of Mr. Kennelly's remarks, of course, lies in the fact that material companies have long been regarded by politicians—state, county, and city—as a source of revenue. These bodies purchase in vast quantities for public works and a difference of a few cents a barrel on the price of sand, cement, or gravel often runs into thousands of dollars even on a comparatively small job.

Robert C. Fenner, an industrial consultant, was elected president, at the meeting. He was also made a director and general manager. Joseph Hock, who has been president, resigned because of ill health, but will remain with the firm as an adviser.

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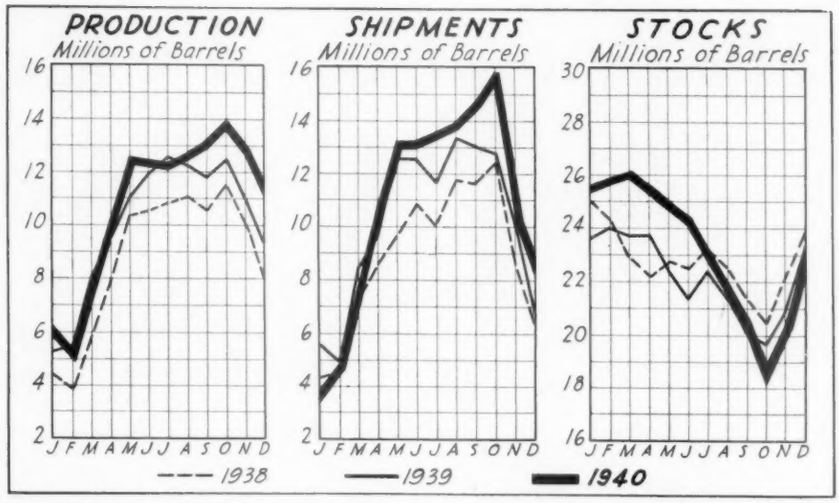
T. S. Wilcox, 76, a member of the firm of Babcock & Wilcox, stone producers of Kasota, Minnesota, for nearly fifty years, passed away a short time ago.




**The Portland-cement industry in December, 1940, produced 11,147,000 barrels, shipped 8,192,000 barrels from the mills, and had in stock at the end of the month 23,305,000 barrels of cement, according to the Bureau of Mines. Production and shipments of cement in December, 1940, showed increases of 17.5 and 20.7 per cent., respectively, as compared with December, 1939. Stocks at mills were 0.6 per cent. lower than a year ago. The preliminary totals of production and shipments for 1940 show increases, respectively, of 6.5 and 6.2 per cent. from the final totals for 1939. The statistics here given are compiled from reports for December received by the Bureau of Mines from all manufacturing plants.**

## Installs Tank to Save Creek from Pollution

The Virginia Glass Sand Company recently completed the installation of a modern sedimentation tank at its plant near Gore, Georgia.

The tank, 12 feet deep and 60 feet in diameter, was installed to prevent contamination of Back Creek.

Installation of the tank was at the insistence of the Virginia Fish & Game Commission.

## Kansas Operator Buys 87-Acre Deposit

Roy More, Junction City, Kansas, sand plant operator, recently purchased an 87-acre deposit in the Republican river bottoms near Junction City.

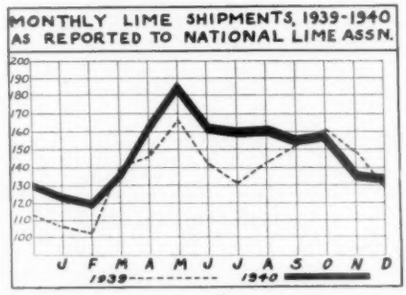
The erection of a new screening plant near the river has been started, and the pumping plant will soon be moved to its new location.

## Erects Loading Dock on Illinois River

The Bellrose Sand Company of Ottawa, Illinois, has received permission from the War Department to build a barge-loading dock on the Illinois river near its silica-sand plant. The loading facilities are now being installed.

## Indianapolis Concerns Effect Consolidation

The Brown-Rosenbarger Gravel Company, Inc., of Indianapolis, and the Standard Materials Corporation, also of that city, have merged and will be known in the future as the Standard Materials Corporation.




**According to data collected by the National Lime Association, 72 companies in December, 1940, shipped 130,424 tons (91,491 quicklime; 38,933 hydrate). Reporting companies represent 51.8 per cent. of the association's total capacity of record. Based on PIT AND QUARRY'S estimates for the remainder of the industry the total shipments for the month are estimated to have been approximately 255,000 tons. Shipments of lime by use and grade for December, 1940, were:**

| Use | Quick lime (tons) | Hydrate (tons) |
|---|---|---|
| Agricultural | 405 | 1,934 |
| Building | 16,494 | 20,259 |
| Chemical | 74,592 | 16,740 |
| Total | 91,491 | 38,933 |

## Penn-Dixie Earnings Show Sharp Upturn

Spurred by the sharp upturn in heavy construction last year, earnings of Pennsylvania-Dixie Cement Company for the year ended December 31, 1940, are believed to have shown marked improvement over the preceding year.

Present indications are that net income for the year may be in the neighborhood of $5.50 a share on the preferred stock, against $361,786 or $2.98 a preferred share earned in 1939.

## Calaveras Fails in Attempt to Obtain Gas to Fire Kilns

The Calaveras Cement Company has apparently failed to gain permission to provide its operations with natural gas from state-leased lands in Rio Vista gas field when Attorney General Warren of California ruled that the state lands commission was without authority to grant easement over which a pipe-line could operate.

The plan of Calaveras has been contested by Standard Oil Company of California on the premise that Calaveras' gas withdrawals would have drained state and other lands through large takings. The cement company had expended a material sum in preparation for natural-gas operation on the basis of the state lease. At present, the company owns one gas well in the Rio Vista field capable of producing 23,000,000 cubic feet of gas a day. It sought to pipe its own gas to its plants, which are currently using fuel oil. Opponents to the plan protested that with the withdrawal of gas from the cement company's well in the volume intended, offset drilling of uneconomic character would be necessary.

## West Coast Aggregates Firm's Earnings Rise

Pacific Coast Aggregates, Inc., central California producer and distributor of sand, stone, gravel, ready-mixed concrete and building materials, reports profit of $79,791 for the nine months ended September 30, 1940, after selling and administrative expense, general expense, depreciation and depletion, but before provision for federal income taxes. This compares with loss of $14,276 for the corresponding period of 1939.

Indicated profit for the third quarter amounted to $60,702 as the company had previously reported profit of $19,039 for the first six months of 1940. In the third quarter of 1939, the company had indicated profit of $32,453.

## Asbestos Production Far Short of Needs

The asbestos industry in the United States produced 15,300 short tons of asbestos of various grades with a value of $484,000 at points of production, according to preliminary figures for 1939 released by William Lane Austin, director of the census.

Although the total value of asbestos produced in the United States in 1939 was 22 per cent. higher than that of 1929 and the quantity produced was over 300 per cent. higher, this country continues to be largely dependent upon imports in order to meet domestic asbestos requirements.

## Blasting-Cap Mishaps Fewer Last Year

Accidents to children from playing with blasting caps in the United States showed a decrease in 1940 as compared to 1939 according to data in the hands of the Institute of Makers of Explosives. In 1940 the record shows that 157 children were injured from this cause in accidents occurring in 33 states. In 1939 there were 195 boys and girls injured. One child died as the result of one such accident in 1940.

As in the other years nearly every case shows that the blasting caps apparently had been carelessly left about where children could get them. In 43 instances the children reported after the accident that they found the caps near construction work, or in fields, streets, roads, in quarries, and in three cases on dumps. In 14 instances they found them in buildings outside the home and in 10 instances they picked them up in cupboards or other parts of the home.

## Gravel Firm Broadens Scope of Operations

The Associated Sand & Gravel Company of Everett, Washington has gone into the manufacture of ready-mixed concrete. Its batching plant has a bin capacity of 400 cubic yards. Concrete is mixed and delivered by two 3-cubic yard Smith-Mobile mixers mounted on G.M.C. trucks.

The company is also considering branching out into the ready-mixed-mortar and lime-putty fields.

## New York Stone Group to Convene March 13

The New York State Crushed Stone Association will hold its annual meeting March 13 at the Hayward Hotel, Rochester, according to Harry R. Hayes, secretary and engineering-director.

All members are urged to be present.

## New Mineral-Wool Plant at Memphis

Production has begun at the new mineral-wool plant of the Building Guard Rock Wool Company at Memphis.

Raw materials used include blast-furnace slag, limestone and silica.

## Conspiracy Indictment Voided in Chicago Ready-Mix Dispute

Federal Judge Philip L. Sullivan, sitting at Chicago, has sustained a demurrer to a federal grand jury indictment charging the late Michael Carrozzo and 11 other defendants with conspiracy to violate the Sherman anti-trust act by restraining the use of ready-mixed concrete in the Chicago area.

Leo F. Tierney, special assistant United States attorney general, said he would appeal the decision to the United States Supreme court. He said he regarded the case as one of the most important ones in the history of the Sherman act.

The effect of the decision is to void the indictment, which was returned last June.

Judge Sullivan, sustaining the demurrer, said in part:

"The indictment alleges and the government contends that the use of truck mixers would result in a savings of labor costs through reduction of the number of men employed. Defendants insist that this is exactly what they are objecting to, and the purpose of strikes or threatened strikes was to compel cement contractors in the Chicago area to accede to the union's demands that the services of engineers be retained on jobs where truck mixers were used; that these activities are within the legitimate objects of a labor union.

"There appears to be nothing unreasonable in these demands, and only lawful means seem to have been used in accomplishing them. I am of the opinion that defendants under such circumstances are immune from prosecution under the Sherman act, by reasons of the provisions of the Norris-La Guardia act, which enlarges the scope of section 20 of the Clayton act."

"Judge Sullivan's decision is clear cut," Mr. Tierney said, "and will present a definite issue for the decision of the Supreme court. As I read the opinion, Judge Sullivan holds that the Norris-La Guardia act by implication strips the courts of jurisdiction in criminal cases involving labor. Should this be the law, a labor organization can control interstate commerce by restricting the sale and shipment of all machinery or devices which displace labor."

The Missouri Portland Cement Company of St. Louis has appointed the Anfenger Advertising Agency, St. Louis, to handle its advertising.

## Important Research on Aggregates and Concrete Under Way

Discussions of standardization and research work in the charge of A.S.T.M. Committee C-9 on Concrete and Concrete Aggregates, which group held a meeting in Washington, D. C., early in December, indicates a productive year for this phase of the Society's activities. The meetings, held at the Washington Hotel, were well attended.

The session was conducted by the chairman, F. H. Jackson, Public Roads Administration, Washington, D. C., and the secretary, R. R. Litehiser, Ohio State Highway Testing Laboratory, Ohio State University.

The interest of the committee was evident in the work to be sponsored by the Joint Committee on Durability of Concrete. Two of the subcommittees of Committee C-9, Subcommittee VI on Relation of Characteristics of Materials and Mixtures to Properties of Concrete, and Subcommittee XVII on Conditions Affecting Durability of Concrete in Structures, are particularly interested.

The group in charge of methods and apparatus for testing concrete expects that four proposed methods of tests will be submitted this year for approval as A.S.T.M. tentative standards covering methods of test for: sampling wet concrete, determining volume of air entrained in concrete, uniformity of a concrete mixture, and determining thickness of cores drilled from a concrete structure.

In the work on aggregates, the subcommittee in charge expects to recommend various revisions in a number of specifications, one covering the test for soundness of aggregates by use of sodium sulphate or magnesium sulphate; another for abrasion of coarse aggregate by use of the Los Angeles machine; and two tests for specific gravity and absorption of coarse and fine aggregate.

One of the subgroups is interested in standardizing requirements for waterproof paper for curing concrete and developments are under way.

As the result of discussion it is proposed that some revisions in the Specifications for Ready-Mixed Concrete (C 94 — 38) be offered for approval, possibly at the March meeting of the committee to be held in Washington during A.S.T.M. Committee Week.

## Installs Semi-Trailers and Diesel Engine

The Columbia Quarry Company recently purchased two 15-ton Easton semi-trailers for use in its quarry at Valmeyer, Illinois. These machines replace motor trucks. A Williams spinner-type separator is being installed on the grinding mill in the pulverized-limestone department of this plant. A year ago a dust collector and fan were installed in this department.

A National Superior 350-horsepower Diesel engine has been purchased for the company's Columbia, Illinois plant to supplement the two Superior engines already installed there. The extra power will make it possible to carry on stripping operations at the same time that the crushed stone and pulverized-limestone plants are operated.

The company recently made its first real venture into the truck-delivery field when it purchased a fleet of 5 semi-trailers of 12½ tons capacity each. Three are Dodge Diesel-powered machines and the other two are of General Motors manufacture.

**Rock in this quarry is being used for bank protection and diversion dikes on the Coachella branch of the All-American Canal in southern California. This view shows a Caterpillar D4 tractor equipped with a Traxcavator (made by the Trackson Company, Milwaukee) which is used to load the trucks. Top yardage attained has been 640 in eight hours.**

## Producer at Oil City Expands Gravel Plant

Work has begun on a $25,000 plant-expansion program by the Oil City Sand & Gravel Company, Oil City, Pennsylvania.

A new all-steel hopper, with a capacity of 600 tons of sand and gravel, is being constructed. Three new steel barges, 100 feet long, 36 feet wide, will be put in service.

**EMPLOYMENT AND PAY-ROLLS**
(Compiled for PIT AND QUARRY by Isador Lubin, Commissioner of Labor Statistics, U. S. Dept. of Labor.)

| Industry | Establishments | Number of Employees | Pay Rolls (1 week) |
|---|---|---|---|
| **Cement:** | | | |
| November, 1940.... | 134 | 21,788 | $610,945 |
| December, 1940.... | 134 | 21,129 | 606,462 |
| Percentage change | | —3.0 | —0.7 |
| **Quarrying and non-metallic mining:** | | | |
| November, 1940.... | 907 | 30,343 | $666,206 |
| December, 1940.... | 907 | 29,274 | 674,278 |
| Percentage change | | —3.5 | +1.2 |

**A Type R gyratory reduction crusher, driven by a separate power unit and all mounted on a big truck, is a unique method now being used by the Allis-Chalmers Manufacturing Company of Milwaukee to show its latest design crusher unit. The mobile unit will travel about the country to demonstrate the crusher right at the plants of the operators. The truck and unit at present are heading south.**

# CURRENT BUSINESS INDICATORS

No longer is there any intimation on the part of anyone connected with the defense program that the stupendous defense effort can be superimposed on normal civilian economy with only moderate adjustments. Well under way in this Nation now, although not yet realized by the majority of the citizenry, is a revitalization not only of United States industry but of the United States itself. The physical volume of goods already being produced is greater than at any time in the history of our country and we are only beginning to fill the tremendous backlog of orders. We are not engaged in a mere armament race, but rather in a titanic struggle of national economic systems from which only the strong will emerge. Even if this Nation survives, and no one can doubt that it will, there may be profound changes in our economic life, changes that may affect the very existence of democratic government.

In the early planning of the defense program much was heard regarding specific quantities of thousands of items needed by the Army and the Navy. Quantities of course are still necessary in measuring output but the defense effort has gone further. A recent statement by Donald Nelson, Director of the Division of Purchases for the Office of Production Management, clearly summarizes present aims:

"The requirements of military and naval equipment * * * are limited by only one thing: The total capacity of every mine, factory, and mill to produce such equipment.

"We no longer are in a position to say 'We need so-and-so many .50-calibre machine guns.' What we now say is: 'We need every .50-calibre machine gun that can be produced by the total coordination of every pound of material, every inch of factory space, and every man-hour of work that can be mobilized for the job.'

"This is an all-out effort. There are no fixed limits save the limits imposed by physical and human capacity employed to their utmost.

"Defense must come first * * * ."

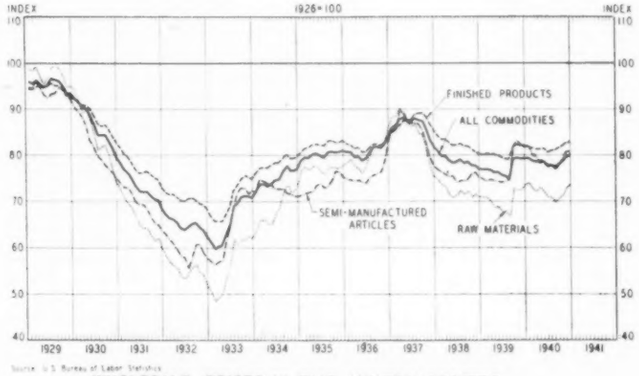
If defense actually is to come first with an all-out effort, what of the so-called social gains of the past eight years. Several weeks ago Mr. Knudsen sounded an ominous warning against the "week end blackout of industry," but as yet there has been no evidence of relaxation in the wages and hours or other regulations, nor does there seem likely to be. Manufacturers, in calculating costs on which to base their bids, can include an allowance for overtime pay beyond the 40-hour week. Raw materials suppliers, however, have no such recourse for by and large the prices they receive for their products are being held rigid by Government edict. Operation beyond 40 hours weekly means higher costs which producers claim can not be absorbed, along with other increases, under existing prices. It is not likely that enough surplus labor is now available to permit 7- or even 6-day operation through the medium of staggered hours. For really effective all-out production of raw materials it seems evident that either a moratorium on overtime pay to permit operation beyond 40 hours or price increases equivalent to overtime costs will of necessity be forthcoming.

Actual shortages of materials are being reported frequently in the press, and it begins to appear more certain that priorities will become more than just a threat to keep producers in line with defense aims. Problems as serious as those in raw materials may develop in connection with manufacturing facilities, labor supply, power, and transportation.

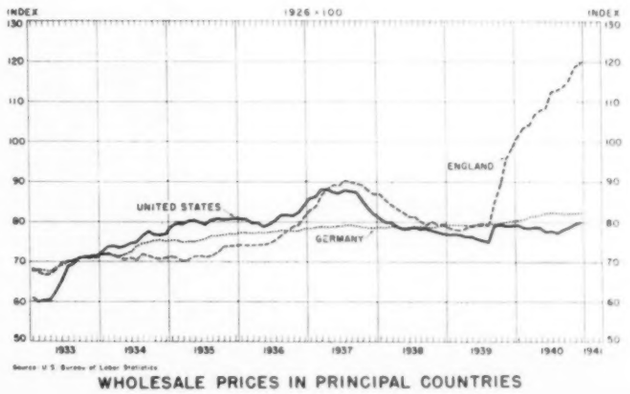
An official pronouncement of the National Association of Purchasing Agents late in February called attention to shortages in certain raw materials as well as in processing equipment. The association said that delivery problems now exist in connection with various alloys, numerous steel items, brass products, aluminum, cobalt, nickel, zinc, and copper, as well as machine tools. It is to be expected that production of non-defense goods will be disturbed as these raw materials are more and more diverted to defense use. The association went on to point out:

"As the tension increases greater efforts are being made to lay in supplies of items that are readily available at this time but which may later be absorbed in Government orders to a large extent. The time is not far distant when changes in various manufacturing operations will be essential unless substitutes are found for the production of goods for other than governmental defense orders.

The direct effect of priorities on producers of nonmetals remains to be seen. Such operations are not direct consumers of brass, zinc, copper, nickel, and other metals in which squeezes have been felt, but the equipment they use is made largely by machinery companies who may be having difficulty already in procuring materials for such non-defense items. The operator of a sand and gravel plant who may be considering a remodelling or expansion program might well investigate his chances of delivery on the required machinery. He may even now run into serious delays. If he then decides to get along with the old plant his troubles may be over only temporarily, for shortages in labor, transportation, or even power may affect either his actual operation or non-defense construction projects on which he is depending for markets. The situation, of course, may never get this acute but it is definitely conceivable that every nonmetals producer ultimately may feel the effects.




WHOLESALE PRICES IN THE UNITED STATES




WHOLESALE PRICES IN PRINCIPAL COUNTRIES

# Bents Supporting 60-Foot Pipe Line Eliminated Through Use of Wire-Rope Tension Members

THE plant of the Peekskill Gravel Company was originally designed to load scows with washed sand or gravel. The natural market for this material, in scow loads, appeared to be the city of New York, only 40 miles south of Peekskill and reached direct by way of the Hudson River. The local demand for sand and gravel was supplied from several pits by various truckmen. The material was sold as masons', or bank-run, sand. Washing and grading were not considered. Only when some large building was being erected in the vicinity of Peekskill would there be any question of cleanliness, grading, or quality. There were very few of these larger projects, so the management was justified in considering the local demand as negligible. The plant design did not provide for truck-loading, except by hand, from ground storage. Scow-loading was considered as the money-making part of the operation. Ground storage, a tunnel and a conveyor provided efficient means for boat-loading.

After operating for one season, 1921, the plant was shut down until 1928. The property was leased in that year and operations were resumed under new management.

Preparatory to the resumption of operations the lessee made the necessary repairs and erected bins for storage and truck-loading. Conditions had changed in 1928 so that truck-loading amounted to 50 per cent. of the annual business. Later shipment by scow proved to be unprofitable and was discontinued.

During this period of operation all the excess sand was wasted, or stored on land adjacent to the plant. When any of this sand was reclaimed, it had to be handled in the same manner as if it had been excavated from the pit. A wooden chute over the loading yard, supported by bents, carried this wasted sand to ground storage, or sluiced the excess to a swamp near the plant. At that time excess sand was thought to be of no value, but it had to be stored where it did not interfere with plant operation. At a later date all this wasted sand was reclaimed to meet the demand peaks. The yard was a dead-end, so that every truck had to make a full turn before leaving with its load. If a truck collided with a bent and dislodged the chute, it was necessary to shut down in order to repair the damage.

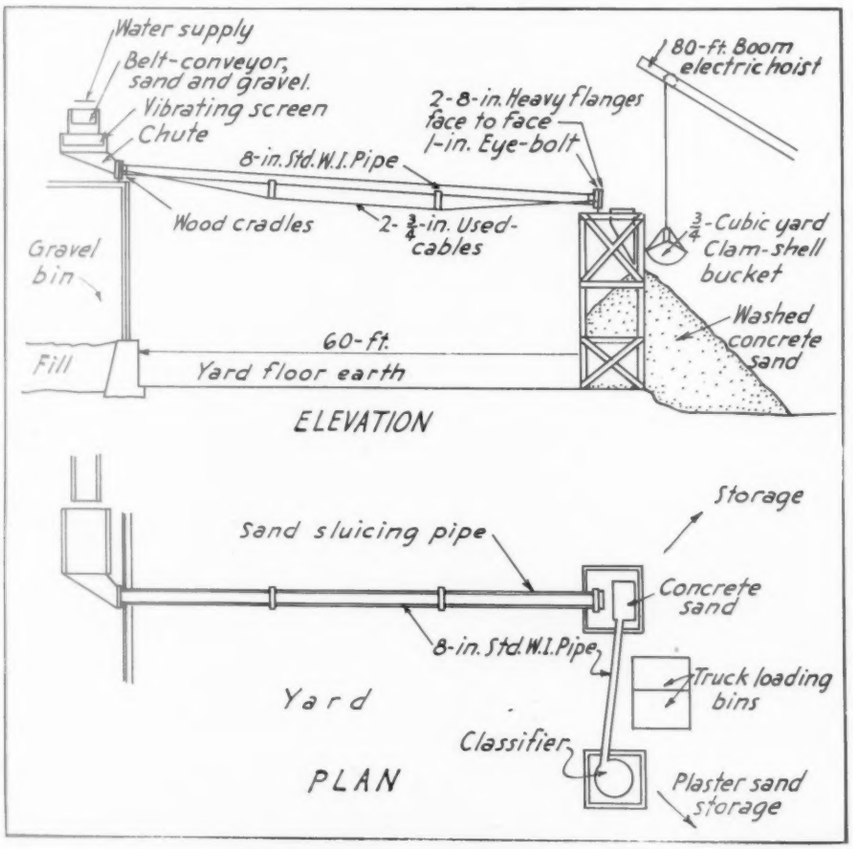
In 1932 the plant changed hands again. The original elevator, screens, sand-tanks and crusher were unsuited to existing conditions. The sand specifications of the New York State Highway Department had been made more exacting, calling for a graded sand. Nothing but a graded material would meet the demands of the gravel customers. Remodeling was out of the question; conditions demanded a new lay-out.

One of the main points to be considered in designing a new plant was the elimination of all bents in the loading yard. This was accomplished by building a truss, with an 8-inch pipe as the compression member and two ¾-inch used wire cables as the tension member. The cables had been used on a derrick, but were too short for further use as a fall line; as they were not raveled they had ample strength for the truss construction. The sand and water from the washing screen were sluiced through the 8-inch pipe to the two classifying tanks on the opposite side of the yard. The truss span was 60 feet. A steel bin with weighing batch boxes was installed between the two classifying tanks. These two tanks were in tandem, one producing concrete sand and the other plaster sand. This sand sluice pipe is an outstanding feature of the modernized plant.

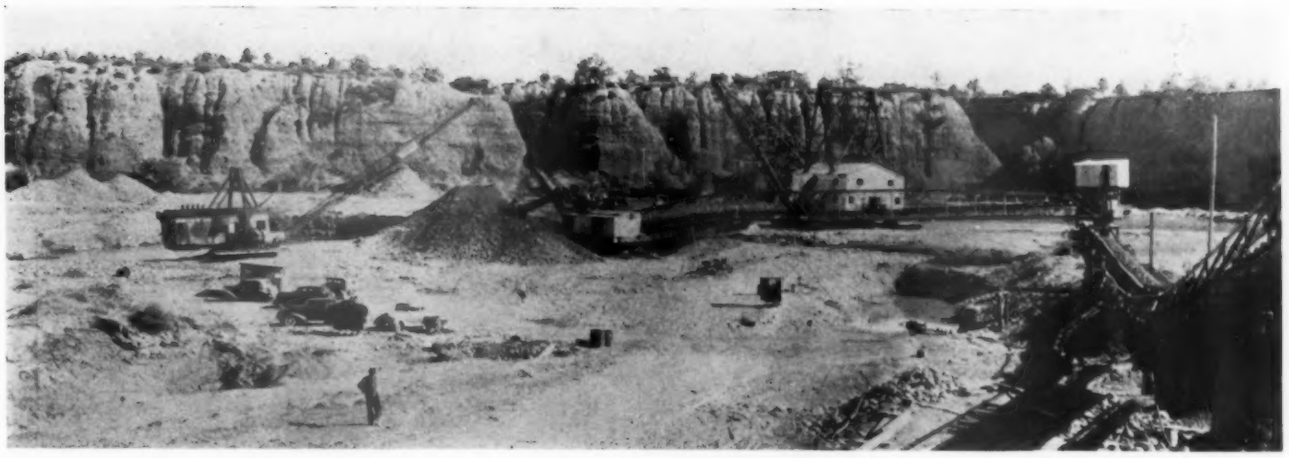
This method of handling the sand made economical storage possible. The derrick, with a clam-shell bucket, could store sand, or load the batching bins. Gravel could be trucked to a point within reach of the derrick, then piled for storage, or loaded into trucks through the batchers.

With the yard cleared, adequate storage and loading facilities provided, the installation of a new conveyor, new screens, new field hopper and new crusher insured a steady output of acceptable material in sufficient quantities to meet the regular demand. The "peaks" of the demand could be supplied from storage. The material was of an excellent quality and easily met the specification requirements.

The batch bins allowed the company to supply ready-mixed trucks, thus keeping in line with the modern demand.




Plan and elevation of the installation at Peekskill.



A general view of part of the pit operations in the Sacramento River bottoms. Shown is some of the loading equipment and the pendulum and pit conveyors.

# Shortage of Fine Sand Fraction Necessitates Elaborate Grinding at Shasta Dam Plant

By W. E. TRAUFFER

IN the sand-and-gravel plant which is supplying all the aggregates for Shasta Dam, near Redding, California, the industry has another laboratory which should add much to present knowledge of aggregate properties and production methods. The first really large plant in which advanced methods were used was the one supplying the aggregates for Boulder Dam. What was learned there was the basis for further developments at the huge Coulee Dam plant, which may turn out to have been the starting point of a new era in sand-and-gravel production. Further contributions to the accumulated fund of knowledge are expected from the new Shasta Dam plant which is being operated by the Columbia Construction Company.

At each of these plants there have been conditions, with respect to their deposits of raw material which would probably have ruled them out as sources for the commercial production of sand and gravel. In each case, however, these projects were hundreds of miles away from any adequate centers of commercial production or from any other first-class undeveloped deposits. For this reason the available deposits had to be utilized and means developed for the production of a product meeting the unusually severe specifications of the U. S. Bureau of Reclamation.

The problem at Boulder Dam was chiefly one of quantity production and storage as the deposits would be engulfed by rising water behind the dam two years before its scheduled completion. Advanced methods of sand classification were important features of this operation.

At Coulee Dam the chief problems were the disposal of an excess of extremely fine sand and the procurement of an adequate amount of cobbles. This operation was one of the first to divide the sand into three fractions and recombine them in the desired proportions.

At Shasta there is a dearth of fine sand and an excess of cobbles and bowlders. The problems are to crush down the oversize gravel, to tap all possible sources of sand, and to grind down the excess coarse sand and fine gravel to provide the needed extreme fines. This problem is further complicated by the fact that there is present in the deposit a small percentage of soft stone which must be broken down and removed by scrubbing. Chiefly for this reason, the percentage of deleterious matter is high and in order to insure its complete removal, some of the minus 60-mesh natural sand is wasted. This adds to the existing deficiency in extreme fines, which has to be compensated for by grinding some of the coarser sand and finer gravel. As a result of these conditions comparatively little of the raw material entering the plant is wasted.

Harry P. Davis, project manager, and W. A. Beach, general superintendent.

Shasta Dam is located about 12 miles north of Redding, California, near the headwaters of the Sacramento River. It is being built by the U. S. Bureau of Reclamation as a multiple-purpose structure whose function in the Central Valley Project is that of a monitor on the Sacramento River and several of its major tributaries. Shasta Reservoir will be operated to regulate the flow of the river for navigation improvement, flood control, salinity repulsion, industrial use, municipal consumption and electric-power generation. Much of the water impounded by this dam will come from the perpetually snow-clad slopes of Mount Shasta, 14,161-foot extinct volcano about 50 miles north of the dam and visible from it.

Shasta will be the second-largest concrete dam in the world, with 6,100,000 cubic yards of concrete compared to 10,500,000 cubic yards at Coulee and 3,250,000 cubic yards at Boulder. It will be a curved gravity-type structure with a crest length of 3,500 feet and a maximum height above its foundation of 560 feet. Second only to Boulder Dam in height and to Coulee Dam in mass, it will be the highest overflow type of dam in the world. A hydroëlectric plant at the base of the dam on

Looking down into the 4-foot gyratory secondary crusher and its feed chute.

the west bank of the river will accommodate five main power units, each to consist of a 75,000-kilowatt generator driven by a 103,000-horsepower turbine.

Construction of the dam and powerhouse was started in September, 1938, under a general contract awarded to Pacific Constructors, Inc., a syndicate of 12 contracting firms representing almost every section of this country. The lake created by this dam is making necessary the replacement of 37 miles of the existing main line of the Southern Pacific Railroad and the building of 30 miles of new line over the mountains. This relocation involves 12 tunnels and 8 major bridges. A major highway relocation project is also involved.

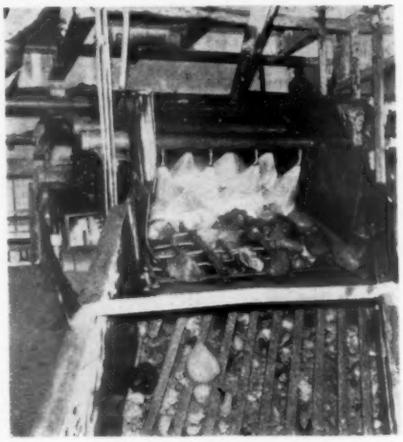
The contract for supplying the estimated 11,000,000 tons of sand and gravel needed for Shasta Dam was awarded to the Columbia Construction Company, which had been prominent in the production of sand and gravel for Boulder, Bonneville and Coulee Dams and in their construction. On its staff are the men who built and operated the sand-and-gravel plants supplying those projects. The plant was designed by the company's engineers and those of the major equipment manufacturers involved. Intended to meet a maximum demand of 22,000 tons in 24 hours, it has actually produced 1,500 tons per hour for two 8-hour shifts without difficulty. This material is to be delivered over a period of 5 years and must be produced as needed at the dam.

The deposit is in the dry bed of the Sacramento River on the outskirts of Redding on what is known as the Kutras tract. Early in the excavating operations it became apparent that selective digging at several points in the deposit would be necessary to keep the crushing and grinding expense low.

Looking down at the 16- by 42-inch jaw primary crusher.

The result is a highly-flexible system of field conveyors which can be relocated on short notice to conform to ever-changing requirements.

At the time of the writer's visit to these operations a 120-B Bucyrus-Erie electric shovel, with a 7-cubic yard Esco light-weight dipper, was loading a hopper on a 42-inch by 200-foot pendulum conveyor. This and other conveyors were being fed by a Bucyrus-Monighan electric walking drag-line, with a 7-

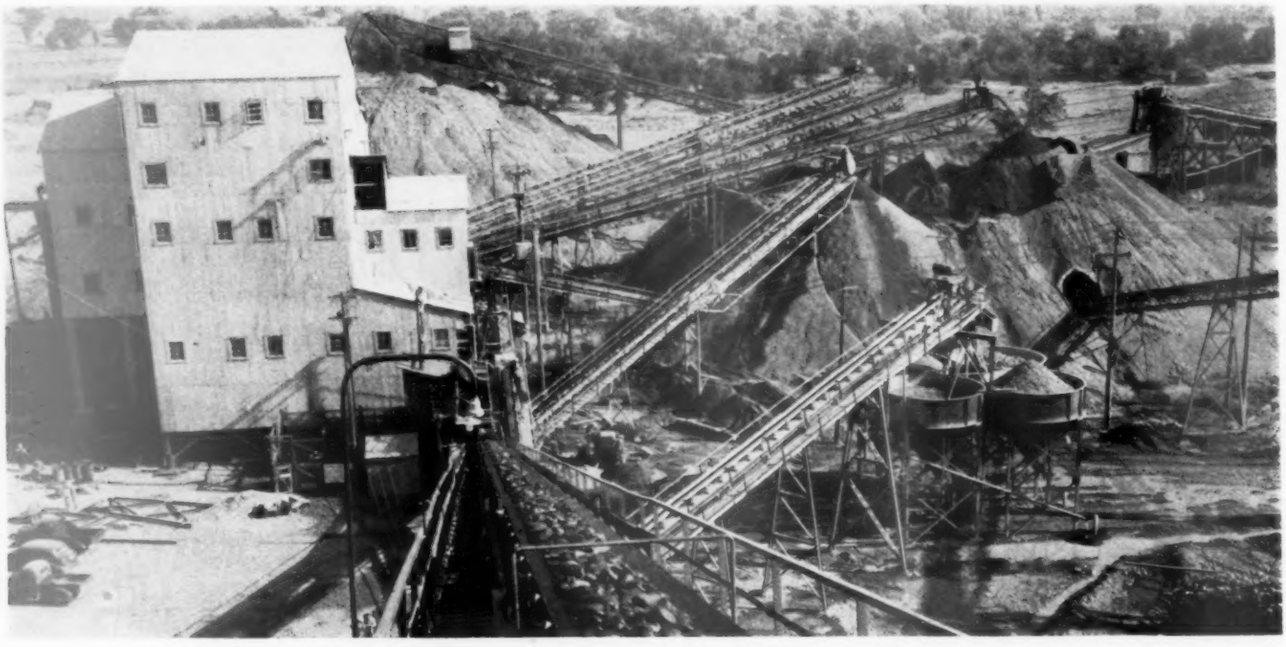


One of the two vibrating scalping screens over the secondary crusher.

cubic yard bucket and a 100-foot boom, and a Bucyrus-Monighan Diesel drag-line, with a 10-cubic yard bucket and a 135-foot boom.

The boom conveyors feed a 42-inch by 600-foot pit conveyor (No. 3), which is extended or moved as operations progress. This feeds the permanent 42-inch by 2,000-foot No. 2 conveyor running to the crushing and scalping building.

A source of sand at some distance from the main pit is being tapped by means of an extensible conveyor fed by a Caterpillar RD 8 tractor and bull-dozer. This conveyor feeds the No. 2



View from top of screening tower showing mill building, sand stock-piling and reclaiming conveyors, truck-loading bins, etc. In the background are the primary crusher building and the raw-material stock-piling conveyor.

Looking down on the 14-foot bowl sand classifier and its rake which produce 28- to 60-mesh sand. At left is the fine-sand rake classifier.

pit conveyor at an intermediate point. Another pendulum conveyor has been installed to feed the No. 2 conveyor which will be extended up to 1,000 feet and is now being fed by the 120-B Bucyrus-Erie shovel already mentioned. All these conveyors and loading machines will be moved as needed and others will be added if necessary.

The material is discharged from the No. 2 pit conveyor over a 7-inch grizzly.

The 8- by 12-foot rod-mill which makes sand out of crushed-gravel fines.

The oversize goes into a 16- by 42-inch Farrel-Bacon jaw crusher set at the same opening. All the material is discharged on a 42-inch by 324-foot inclined belt-conveyor and thence on a raw-material surge stock-pile. About 8,200 tons of live-stored material can be withdrawn from this by three Jeffrey-Traylor vibrating feeders in a tunnel under the pile. Over these feeders are lever-operated sliding gates with air-operated drop gates to further regulate the flow of the material. The 42-inch by 375-foot reclaiming rib-belt-conveyor (*A*), running to the mill building passes over a Merrick Weightometer and Rateograph, which records the actual input of raw material into the plant. All the conveyors up to this point have a capacity of 1,250 tons per hour.

In the mill building the material is split to a pair of 5- by 10-foot Tyler Ty-Rock 2-deck screens with 6- and 2-inch openings. The oversize is chuted into a Traylor 4-foot gyratory crusher. The 2- to 6-inch gravel retained on the lower decks of these screens goes directly into a rotary scrubber to be described later. Material passing through the bottom deck goes to a second pair of 5- by 10-foot Ty-Rock screens with ⅝- and ¼-inch wire cloth. The materials passing over both decks of these screens go to the 8- by 30-foot Joshua Hendy revolving scrubber, whose product is discharged on a Ty-Rock 5- by 10-foot 2-deck dewatering screen with ⅝- and ¼-inch cloth. The material and water coming through the bottom deck of this screen goes into a Chain Belt Rex sand-drag which overflows much of the deleterious matter. All these screens are equipped with Chain Belt Rex high-pressure spray nozzles.

The 8- by 11-foot slug-mill used for sand reduction and some of the jigs which recover gold.

The gravel retained on both decks of the dewatering screen and the product of the Traylor crusher are carried on a 36-inch by 396-foot belt-conveyor (*B*) running to the top of the screening tower, where it is split to a pair of 5- by 10-foot Ty-Rock 2-deck screens. These are equipped with 3- and 1¾-inch wire cloth. The 3- to 6-inch cobbles passing over the top deck of this screen go through a stone-ladder into a stock-pile. The 1½- to 3-inch gravel coming off the bottom deck is carried on a 24-inch by 44-foot conveyor (*C*) to the stone-ladder of a second stock-pile.

Looking up at the 14-foot bowl classifier which produces 28- to 60-mesh sand.

The material passing through the bottom decks of these screens goes to a second identical pair of Ty-Rock screens with ¾- and ¼-inch wire cloth. The ¾- to 1½-inch material coming off the top decks of these screens is carried on an 18-inch by 100-foot conveyor (*D*) to a third stone-ladder and stock-pile. The ¼- to ¾-inch material coming off their bottom decks is carried on an 18-inch by 160-foot conveyor (*E*) to a fourth stock-pile. The fine material falling through the bottom decks of this last pair of screens goes through a launder into the Chain Belt sand-drag. These screens are also equipped with Chain Belt Rex spray-nozzles.

The minus 3/16-inch sand falling through the bottom decks of the second pair of Ty-Rock screens in the flow goes by gravity into an 8- by 11-foot Allis-Chalmers slug-mill. This was originally loaded with steel slugs, then large cobbles were tried. At the time of the writer's visit to this plant 3½- by 5-inch American Forge Company manganese-steel grinding balls were being used to break down the sand and deleterious matter.

All the material from the slug-mill goes into a Dorr 20-foot diameter hydroseparator, which also receives the product of a Marcy rod-mill to be described later. The hydroseparator product is dewatered in a 9- by 30-foot Door rake classifier and is then discharged by a 24-inch by 222-foot conveyor (*L*) into a stock-pile as No. 1 or 4- to 28-mesh coarse sand.

The overflow from the 20-foot hydroseparator goes into a 14-foot Dorr hydroseparator. Its product is dewatered by an 8- by 27-foot Dorr rake classifier and is then discharged by a 20-inch by 255-foot conveyor (*K*) into a second stock-pile as No. 2 or 28- to 60-mesh intermediate sand.

The overflow from the second hydro-

The 8- by 30-foot srubber used to clean all gravel under 6 inches in size.

separator goes into a 6- by 33-foot Dorr rake classifier. Its overflow was formerly wasted but now goes into a Dorr classifier with a 25-foot bowl and a 14- by 36½-foot rake. The product of this classifier is discharged direct, or by a short belt-conveyor, on an 18-inch by 301-foot conveyor, (*J*). These materials are discharged into a third stock-pile as No. 3 or 60- to 100-mesh fine sand. The overflow from this and other departments is pumped to waste by a 4-inch Kimball-Krogh centrifugal pump.

Each of the four gravel stock-piles has a live-storage capacity of 2,000 tons.

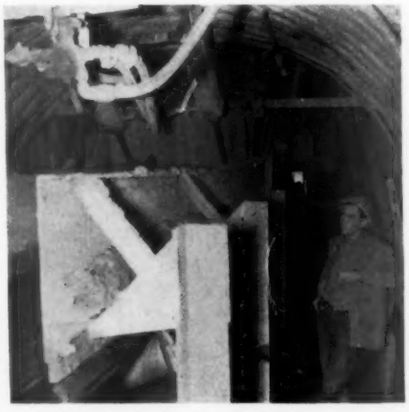
Typical motor-reducer drive of the conveyor to the screening tower.

The four are arranged in a row over a laminated-wood reclaiming tunnel with a concrete floor. Under each pile is a gravity gate which is operated by a 1-horsepower motor and feeds on 36-inch by 343-foot reclaiming conveyor (*F*). Gravel was formerly fed from this conveyor to a hopper feeding the belt-conveyor system running to the dam. In order to remove degradation from the various gravels a rescreening system was recently installed. The material coming from conveyor (*F*) is now discharged to either of two 5- by 12-foot Ty-Rock 2-deck screens, one equipped with 3½- and 1¾-inch cloth, the other with ⅞- and 3/16-inch cloth. A system of chutes makes it possible to feed any of the four sizes of gravel to the proper screen and to discharge them on the dam conveyor system. A Merrick Weightometer with a Rateograph was formerly located on this conveyor but has been moved to the dam end of the conveyor system running to the dam. This is now the pay-off point at which the contractor takes over the aggregates.

The undersize coming from these screens is carried on a series of two short 24-inch belt-conveyors to a small surge-pile. A 24-inch by 43-foot reclaiming belt-conveyor under the pile feeds this material as desired on a 24-inch by 347-foot belt-conveyor (*G*), which is in the tunnel under the main gravel stock-piles. This conveyor was originally installed to return stock-piled materials for recrushing if desired, and it can still be used for that purpose. It also is fed through motor-operated gates.

Conveyor (*G*) can also feed to a 24-inch by 134-foot belt-conveyor. (*R*), which supplies four 110-ton steel truck-loading bins. Trucks are being used to deliver about 300,000 tons of aggregates for the various bridges made necessary by the relocations of highways and railroads due to the dam. Trucks are also loaded direct from stock-piles by a Trackson ½-cubic yard Traxcavator mounted on a Caterpillar tractor. Such shipments are weighed on a Buffalo truck scale.

In the above-mentioned recrushing circuit conveyor (*G*) feeds a Nordberg Symons 4-foot short-head cone crusher. The crushed gravel is carried on an 18-inch by 213-foot conveyor (*N*) to a 5- by 10-foot Ty-Rock 2-deck screen. This has ⅝- and ⅛-inch wire cloth. The oversize goes on an 18-inch by 78-foot conveyor (*P*) to a Symons 4-foot short-head cone crusher, which is usually set to produce minus ⅜-inch material. Its product is carried back to the screen in closed circuit on an 18-inch by 90-foot conveyor (*Q*).



One of the three electric vibrating feeders under the raw-material stock-pile.

The material falling through the bottom deck of this screen goes to the Chain Belt sand-drag already described. The dewatered product of the sand-drag and the material coming off the bottom deck of the screen are discharged on an 18-inch by 152-foot belt-conveyor (*O*). This feeds a large stock-pile with a live-storage capacity of 1,000 tons. Material is reclaimed from storage on an 18-inch by 229-foot conveyor (*I*), with a Merrick Weightometer and Rateograph which feeds the Marcy 8- by 12-foot rod-mill previously mentioned.

The product of the rod-mill ordinarily goes to the 20-foot Dorr hydroseparator already described. When there is an excess of No. 1 sand, this is withdrawn from its pile on a conveyor.

The plant with mill building and sand stock-piles at left and screening tower and gravel stock-piles at right. In the foreground is the 9.6-mile belt-conveyor to the dam.

In this case the rod-mill product is discharged to the 14-foot Dorr hydroseparator.

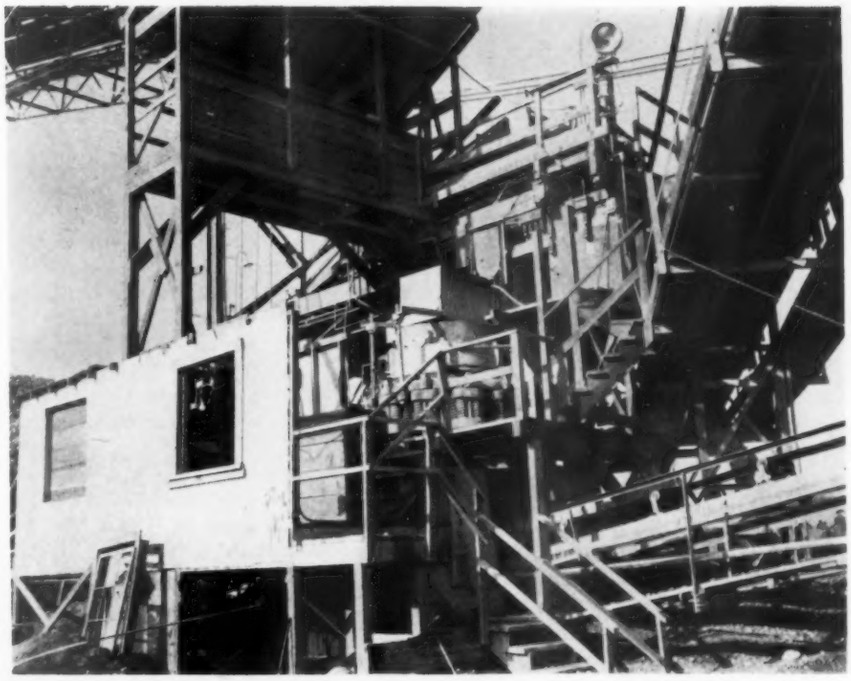
In the tunnel under the three sand stock-piles are individual gates with rotary-vane feeders driven by variable-speed motors. These feed the three sand fractions to three Merrick Feedoweights, which can be set for any desired rate of feed. The blended sand is carried on a 30-inch by 772-foot reclaiming conveyor (*M*), to the blended-sand stock-pile, where it is distributed by a Bodinson traveling wing tripper.

One of the centrifugal pumps used to dispose of waste water.

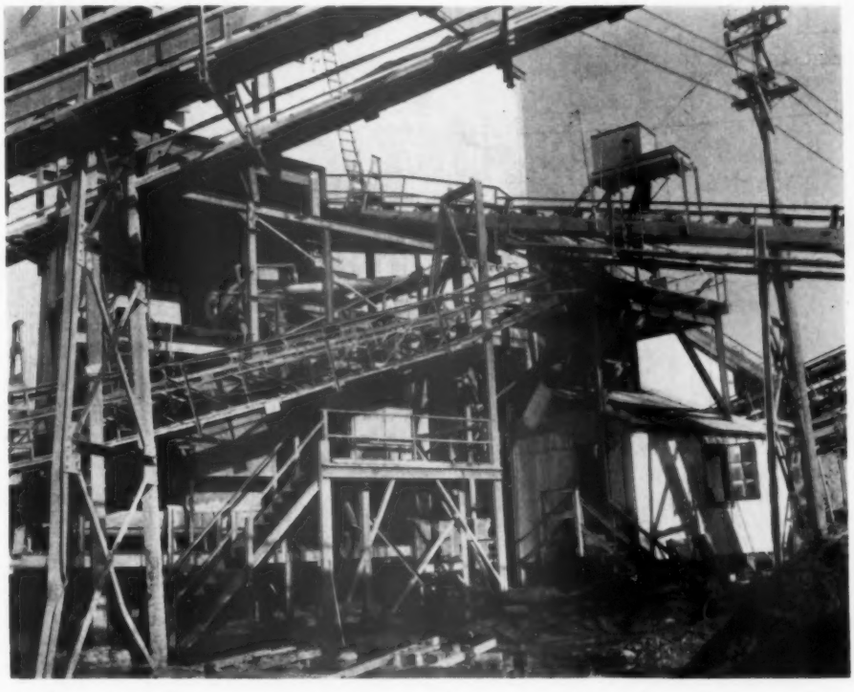
The blended-sand stock-pile has a live storage capacity of 30,000 tons reclaimable through five openings in a tunnel under it. Five motor-operated gravity gates feed the sand on a 36-inch by 445-foot conveyor (*H*), which discharges it on the dam conveyor system. A Merrick Weightometer and Rateograph on conveyor (*H*) record the sand out-put.

Like most sand-and-gravel deposits in northern California, this one contains gold, and investigations proved that there is enough present to justify the installation of equipment for reclaiming it.

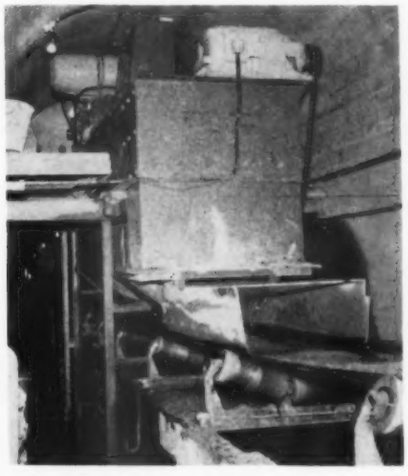
The minus 3/16-inch product of the slug- and rod-mills, before going to the 20-foot Dorr hydroseparator, passes over two rows of eight Pan-American rougher jigs. Each jig has a steel bed-plate with 3/16-inch wide slotted perforations. Iron shot, placed on these beds to a depth of 1 inch, is kept in agitation by 16 pulsators under them.



The 4-foot short-head cone crusher used to recrush stock-piled gravel.



Visible in this picture are some of the many belt-conveyors, the scrubber and the secondary crusher. At right above is the device which weighs the feed to the rod-mill.

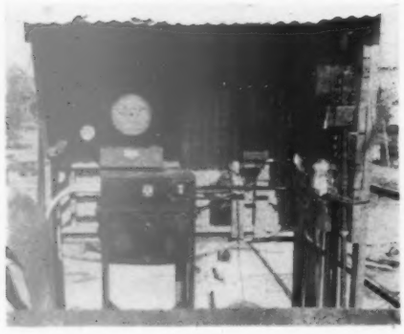


One of the three weighing feeders which blend sand fractions.

Clean sand overflows the jigs to the hydroseparator.

Sediment passing through the plates consists of gold, some sand, and small amounts of lead, tramp iron, etc. This sediment drops into 16 lead traps, where jets keep it in agitation, overflowing everything except the lead and iron. These traps are cleaned out periodically.

The overflowing flour gold and black sand are deposited in a drag dewaterer followed by a single cleaner jig. The



The mechanism which makes a permanent record of the amount of sand loaded out.

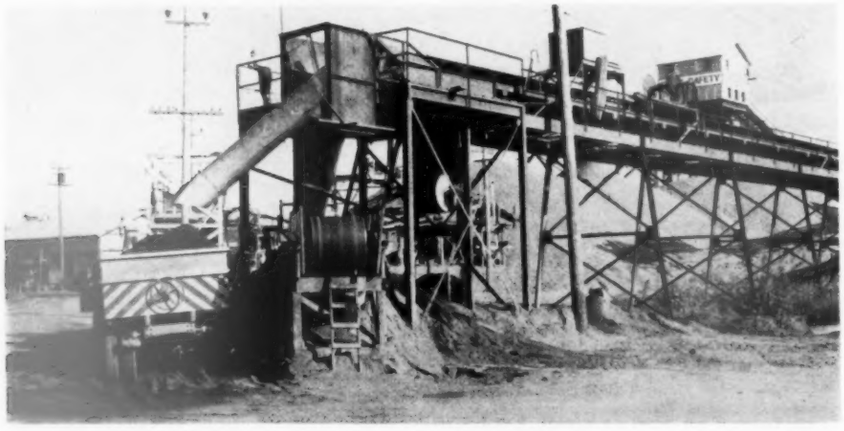
latter has two pulsators and has finer perforations in its bed screen. The overflow goes to the No. 2 classifier and the "throughs" go into a Pan-American revolving amalgamator 18 inches in diameter and 48 inches long with six radial copper plates coated with mercury. The fine gold adheres to the plates and all the other material goes to a Pan-American scavenger jig with two pulsators and very fine perforations. Regular tests are made and when the first of the two traps under this jig shows color (gold) more mercury is put on the amalgamator plates. The latter are removed about every 200,000 tons of output and the gold scraped off. When the lead traps are cleaned out the collected material is passed through the scavenger jig and then sent out to be separated.

The entire plant is operated from a central control panel and one man in the top of the mill building controls all the operations from conveyor (*A*) to the final storage of the finished products. The pit conveyors, crusher circuit, sand blending and loading of the dam conveyor are not affected by plant operations and are separately controlled. No effort has been spared to make this a safe plant for both employees and the machinery. All the drives have guards, all the moving machinery is screened or fenced, and guard rails are used where necessary. All the equipment in any flow is electrically interlocked. All employees in exposed positions wear B. F. McDonald Type F safety hats.

Most of the conveyor belting used throughout the plant is Goodyear, but some Pioneer and Goodrich belting is also used. This belting, and that on the dam conveyor, is endless and was vulcanized on the job. Chain Belt Rex, Bodinson and Robins conveyor idlers are used and most of the pulleys are of Link-Belt manufacture.

U. S. motors predominate but General Electric and other makes are also represented. All of the motors in the plant are U. S. and in the entire operation there are 70 U. S. Uniclosed, Varidrive and Syncrogear motors totaling 2,000 horsepower. Most of the conveyors are driven through Pacific motor-reducers.

Chain Belt Rex spray nozzles are used on all the wet screens. Several different makes of wire cloth are used.

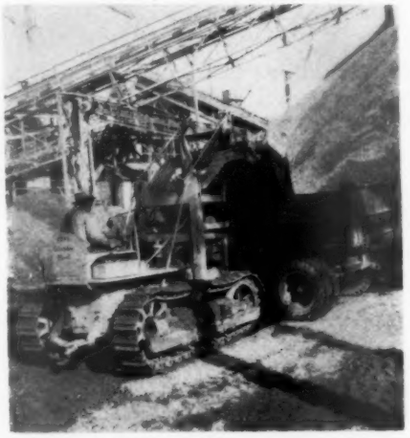


A truck being loaded from the sand-reclaiming conveyor. Also shown is the tail end of the first of the series of conveyors to the dam.

Illumination for night operation is provided by a large number of Curtis 500 W X-Ray projectors distributed about the plant and pit.

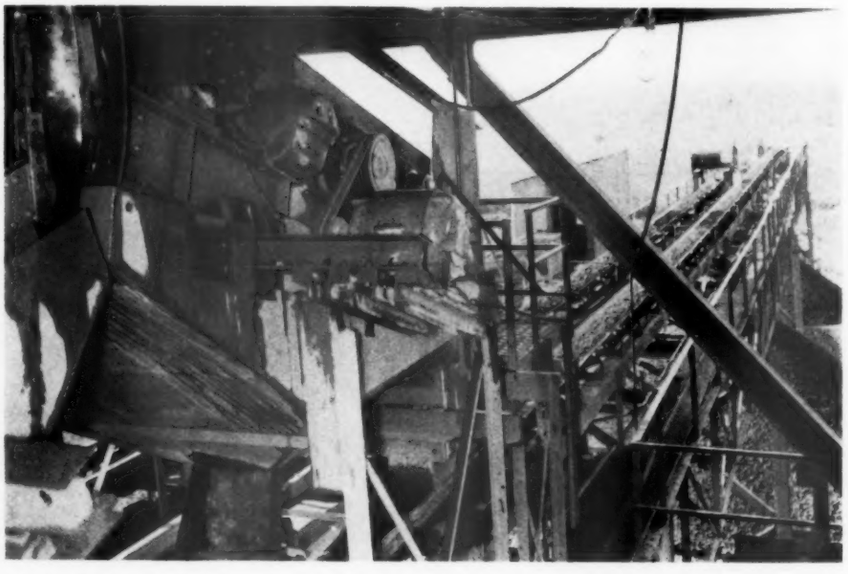
Compressed air for the plant is supplied by an Ingersoll-Rand 6-cyclinder radial-type compressor.

Water for washing is obtained from the Sacramento River by a Peerless 5,000-g.p.m. pump and a Bingham 2,400-g.p.m. pump, both of the turbine type. Waste water is pumped back into the Sacramento River by a 4-inch Kimball-Krogh pump and four Bingham pumps, all of the centrifugal type.



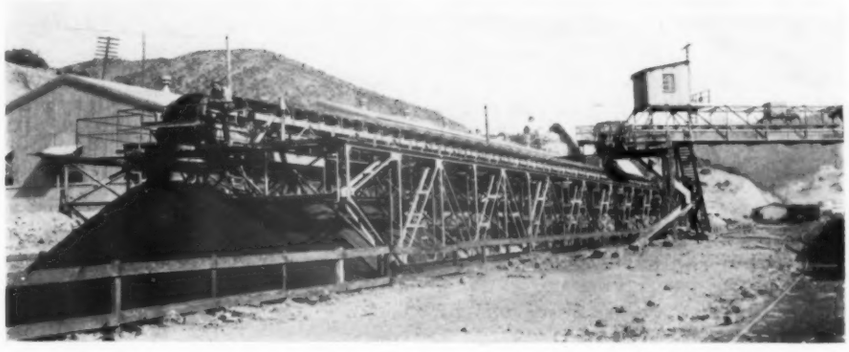
The ½-cubic yard tractor-mounted shovel loading truck from stock-pile.

The 9.6-mile conveyor system from the sand-and-gravel plant to the dam is the longest ever built and has been described and illustrated in this and other journals. It was built only after extensive investigation of other methods of haulage showed them to be impractical. The only reasonable alternative was to construct a special railway line which would have been expensive but



One of the two fine-sizing screens in the gravel screening tower with stock-piling conveyors in background.

The bridge which carries the conveyor to the dam over U. S. Highway No. 99, main route between California and the Pacific Northwest.



The traveling steel conveyor frame which discharges the sand and gravel into 1,200-ton surge storage at end of conveyor system from plant (right).

feasible for the first two years of the contract. After that the rising level of the water behind the dam would have covered up the present railway tunnel at the dam which will become a diversion tunnel.

The conveyor system, after early trouble due to floods, has worked out very well. The conveyor belts are expected to last the life of the job and by that time will have carried at least 11,000,000 tons.

The conveyor system consists of 26 separate conveyor units each driven by a 200-horsepower motor except the last which is driven by a 72-horsepower motor. Starting at an elevation of 497 feet above sea level, the conveyor system reaches a 1,450-foot elevation and the end of the system is at the 652-foot level. Some idea of the ruggedness of the terrain over which the material is conveyed is evident from the fact that the change in elevation in one 1,192-foot section is 197 feet.

The motors of the three sections nearest the discharge end are regenerative. These sections have a combined drop of 445 feet in a distance of 5,339 feet. There are eight tangents in the system and seven changes in direction. The system crosses one main Federal highway, two railroads, and twice crosses the Sacramento River.

The belt-conveyor capacity when fully loaded is 1,100 tons per hour and material traverses the distance in 1 hour and 40 minutes. General Electric motors drive these conveyors through Pacific motor-reducers. Chain Belt Rex conveyor idlers, Link-Belt pulleys and Robins training idlers are used exclusively. The 36-inch, 6-ply Goodyear conveyor belting was specially designed for this job. Near the end of the last conveyor is the Merrick Weightometer and Rateograph whose records determine the payments for aggregates.

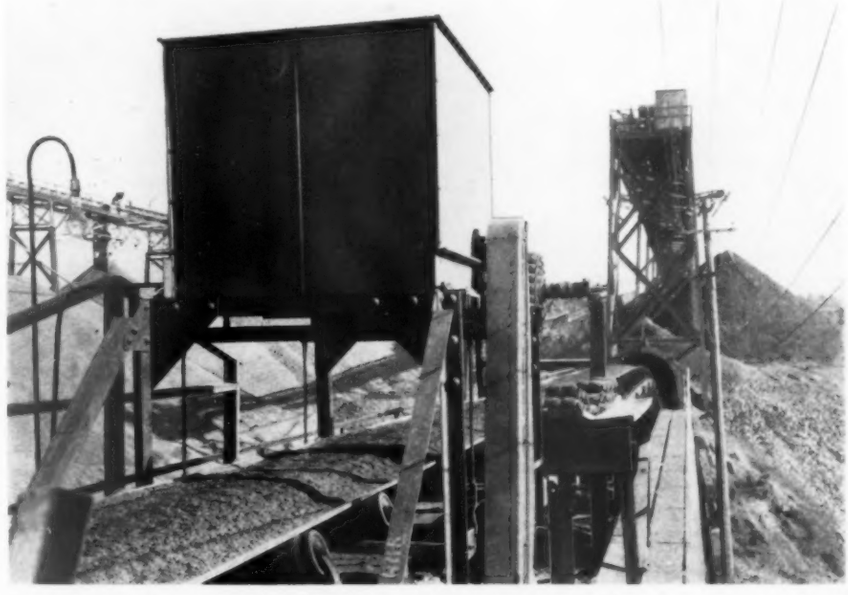
The belt-conveyor system has an 80-foot right-of-way and a well-maintained roadway was built for its entire length to provide quick access to all points.

Control of the system is absolutely fool-proof. Automatic interlocking controls will stop the entire system if anything interferes with the operation of any single unit and the one at fault will be indicated on the control panel. Telephone stations at each head-station along the system make it possible to get at the trouble quickly.

At the discharge end of the conveyor system is a Bodinson 42-inch by 160-foot shuttle belt-conveyor on a huge traveling steel frame. This provides surge storage for 1200 tons in 5 different compartments of a ground-level storage. Belt-conveyors reclaim this material to a 160,000-ton stock-pile system near the track hoppers. In changing from one material to another at the aggregate plant one minute is allowed to give time for moving of the shuttle frame at the dam end of the system. Control by telephone is provided.

The concrete-mixing plant at Shasta Dam is identical in design with those operated at Coulee Dam. It is a tower-type fully-automatic plant designed and equipped by the C. S. Johnson Company. Five 4-cubic yard Koehring mixers are used. The plant bins store 4,000 tons of sand, gravel and cement. The average run is expected to be 6,000 cubic yards of concrete in 24 hours, but the plant is capable of producing consider-

*(Continued on page 53)*



The device which weighs blended sand on conveyor from stock-pile in background. Above the tunnel is the stock-piling conveyor and traveling tripper.

# Economy Rules in Legislatures; What Various States Are Doing

STATE legislative bodies in February had completed organization formalities; saw introduction of a majority of the bills they will be asked to consider during current sessions; had started study of the many proposals, and had disposed of a few of them.

Legislative procedure in several states provides a dead-line for introduction of bills, after which date unanimous approval of fellow law-makers must be obtained before a member may bring forward a new proposal. In several states such dead-lines were passed last month; in one of them it brought forth more than 4,000 bills and resolutions.

Tennessee became the first state to conclude its 1941 session, but law-makers found it necessary to stop the legislative clock on February 15 while winding up odds and ends remaining at high noon, the hour previously set by joint resolution for adjournment. It was one of the shortest legislative sessions in the state's history, 41 days, or nine days less than the time Governor Prentice Cooper urged members to meet, and 34 days less than the 75-day limit set by the state constitution.

It has become increasingly apparent that measures calling for new expenditures will be more carefully scrutinized than for many years past. State law-makers appear determined to exercise economy in state expenditures in view of present and future defense burdens. Governors in 27 of the 42 states where legislatures were in session during February have asked that no new or additional state taxes be levied, and that economy be employed by state legislators.

Labor groups are expected to receive encouragement in their campaign for state wage-hour laws to govern intra-state commerce by a United States Supreme Court decision of February 3 upholding the constitutionality of the federal act governing wages and hours of employees working in interstate commerce industries. Of interest in this connection, however, is rejection of a state wage-hour bill by the lower branch of the Arkansas legislature three days after the court's decision.

Rhode Island became the first state to enact a law requiring employers to reëmploy persons inducted into the armed forces of the United States upon their discharge from the Army or Navy. Similar bills have been brought before practically all state legislative bodies, and probably will be approved by a majority of them.

State legislative activity of particular interest to the industry last month included:

*Arkansas.*—A new House bill, referred to the Committee on Labor, would fix a minimum price of 6½ cents a cubic yard of gravel for each mile hauled on the highways up to 5 miles, graduated down to 5 cents a cubic yard for each mile hauled after the twelfth mile.

Nearing final House approval was a House bill to levy a $50 annual license fee on itinerant merchants who travel with trucks or automobiles, requiring them to post a $500 bond to guarantee payment of any legal license fees, and a $1,000 bond to protect the public against fraud and to pay judgments obtained for civil liability arising out of the conduct of their business.

A new House bill to levy a tax of $1.03 a ton on bauxite is being pushed by Senate and House *blocs* seeking funds for old-age pensions. The measure is receiving preference over one introduced earlier to levy a tax of 10 cents a ton on the product. The present tax is 2.5 per cent. of its value at the point of severance, and the present value is $2.25 a long ton. During a hearing on the measure operators protested that the $1.03 tax would make it impossible to meet foreign (out-of-state) competition, bring about greatly curtailed operations and in some cases a complete shut-down.

Another bill, not beyond the introduction state, would require that within 12 months all "tangible natural resources severed from the lands or waters within the state of Arkansas shall be processed, refined, fabricated or manufactured into a finished product within the state of Arkansas." Representative O. E. Gates, author of the measure, declared that "our natural resources are being exploited by Eastern capitalists. The establishment of processing plants in Arkansas would bring untold wealth to the state that now goes to other areas. I am going to fight to keep this money at home."

A special Senate investigating committee reported that reductions in workmen's compensation rates would shortly be promulgated in an order of Insurance Commissioner J. H. Graves and made retroactive to December 5, 1940. The rate to apply to the concrete industry would be lowered from $11.47 to $10.85 per $100 of average pay-roll.

A House bill for a state wage-hour law was tabled in a parliamentary maneuver that eliminated a roll call. Many legislators were being squeezed by workers and employers alike, and welcomed an opportunity to avoid a vote that would place them on record. The bill had received the endorsement of the Arkansas Federation of Labor (A. F. of L.), the Arkansas Industrial Union Council (C. I. O.), and State Labor Commissioner, Edward I. McKinley, Sr.

*California.*—After devoting three weeks to organization and the introduction of bills the legislature recessed to March 3. During the recess period the state printer will make ready 1,291 Senate and 2,564 House bills for study by legislators. In this lot are more than 25 that directly affect the nonmetallic-mineral industries and copies of most of them were not yet available when PIT AND QUARRY went to press. A majority of them will not get far beyond the introduction stage, and others will be discussed as they receive legislative attention.

*Colorado.*—A new House bill would provide a license tax for the privilege of mining, quarrying and extracting natural resources. It was referred to the Committee on Finance, Ways and Means.

Other new bills would require the use of approved safety devices and machinery in industries where silicosis and other dust diseases are hazards; would include occupational diseases in the workmen's compensation act; would regulate the manufacture, sale, distribution, use and possession of explosives; and would provide an industrial commission safety fund to defray the expense of the commission in promoting and encouraging the use of safety devices and safety methods in industry.

Wage-hour and labor-relations bills have been introduced, but it was not apparent in late February what treatment they would receive.

A Senate bill seeks to place a form of control over trade associations, along with labor unions and associations of employers and employees, requiring the making, furnishing and publication of financial reports.

*Illinois.*—A House bill would provide that in the determination of the lowest responsible bidder preference shall be given to a person or corporation whose plant is located within the state if his bid is not more than 10 per cent. greater than the bid of a person whose plant is located outside Illinois.

Bills to strengthen the state wage-hour law, and to provide a state labor-relations act have been introduced in the House and referred to committees.

*Indiana.*—A new Senate bill would

require operators of gravel pits located within one-half mile of a road or street to erect fences or other barriers for the protection of the public, while a House bill would provide for licensing and regulation, by the secretary of state upon payment of a $3 fee, of meters, weighing devices and other machines used in measuring. Other bills would provide for county control over the manufacture and handling of explosives, and would permit the use of red spotlights on vehicles used for transporting explosives.

*Kansas.*—A bill introduced in the House would require that agencies purchasing supplies for the state shall contract only for Kansas-made materials when they are obtainable in commercial quantities in the state, and when they are obtainable at a reasonable price. It refers specifically to rock, sand, gravel, cement, chats and other items.

Both House and Senate received a bill to license and regulate itinerant merchants. A similar bill was killed by the 1939 session. The proposal calls for an annual license fee of $25 and a $500 bond to cover any taxes and penalties and "for the purpose of protecting the public against fraud".

*Massachusetts.*—A House bill, introduced at the request of the State Conference of Bricklayers, Masons and Plasterers International Union, would prohibit the use of terra-cotta blocks, cinder blocks and cement blocks as substitute for brick and stone in the construction of exterior walls of public buildings. Several bills would provide further regulation for the manufacture, storage, selling and use of explosives, while a new House bill would require employers of workers in hazardous occupations to provide workmen's compensation protection.

*Michigan.*—Administration bills to liberalize laws in favor of labor will have tough sledding in the Republican-dominated House Committee on Labor, it became apparent last month. Representative Walter G. Herrick, committee chairman, remarked that "labor laws as they now stand are pretty good." Among bills before the committee is a wage-hour proposal, carrying out the program of Democratic Governor Murray D. Van Wagoner, who asked that this legislation "be made available to all Michigan workers, and not only to those employed by industries engaged in interstate commerce".

*Minnesota.*—A Senate bill, recommended for passage by that body's Committee on Taxes and Tax Laws, would add sand, gravel and top soil to structures, standing timber and minerals in prohibiting their removal from tax-delinquent lands.

A House bill would increase from 20 to 40 acres the size of a plot of ground that may be acquired by local governing units to obtain gravel, stone, clay or sand for road purposes, and would permit the acquisition of the same size plots in an adjoining town or country when necessary.

Bills for the regulation of explosives have been introduced in both branches of the legislature.

*Montana.*—A House bill to provide benefits for silicosis victims under the workmen's compensation act was condemned as opening the way for "racketeering" before a committee of the House. It was argued that employers would be penalized unjustly in being made to pay compensation for victims who did not contract the disease while in their employ.

Meanwhile, both houses approved and sent to the governor a bill making silicosis sufferers eligible for relief.

*New Jersey.*—A new Assembly measure would double the compensation payments where employers fail to safeguard machinery after notification by the department of labor, while a Senate bill would provide for regulation of the manufacture and use of explosives under the department of labor. Both were referred to the Committee on Labor.

Two bills calling for a state wage-hour law were introduced in the lower branch, one calling for an appropriation of $70,000 for enforcement.

The legislature, which meets on Mondays throughout the year, voted to take a two-week recess following the February 17 meeting.

*New York.*—A bill introduced in both branches of the legislature would provide that in construction of public buildings or works where natural stone, such as marble, sandstone, bluestone or limestone, is specified, such stone shall be fabricated in the state.

Three bills for further control over explosives have been introduced.

*Ohio.*—Specific exemption of clay, limestone and shale from the prohibition against the use of gasoline or fuel oil engines in mines would be granted by a House bill. Another bill would create a natural resources coördinating board to provide for coöperation between departments and agencies, and to assemble and disseminate information on the state's natural resources. Several bills to provide further regulation of the manufacture, storage, transportation and use of explosives have been introduced and referred to committees.

A bill to establish a wage-hour law for intrastate commerce, patterned after the federal law, has been introduced in the House.

*Oklahoma.*—A state wage-hour law is called for in a new House bill, while a Senate bill would regulate the sale, manufacture, distribution, use and possession of explosives. The latter measure was referred to the Senate Committee on Manufacturing and Industry.

*Oregon.*— A Senate bill, referred to the Committee on Industries, would provide compensation for workmen incapacitated by reason of occupational diseases.

Two bills introduced in the House would provide for state wage-hour acts. Both were referred to the Committee on Labor and Industries.

*Rhode Island.*—A House bill, referred to the Committee on Labor Legislation, seeks to provide for an investigation and study of accidents and occupational diseases in trade and industry with the object of determining and establishing safety codes.

A House bill before the Judiciary Committee would provide a state wage-hour act. Two others bills before the the same committee would provide state control through licensing of the manufacture, sale and use of explosives.

*South Dakota.*—Governor Harland J. Bushfield, addressing both branches of the legislature, reëmphasized statements made in his first message to the legislature for reduced taxes, and asked that the sales tax be cut from 3 to 2 per cent.

*Tennessee.*—A bill to tax itinerant merchants failed of passage in the House.

*Texas.*—A House bill, introduced by Representative Reese Turner, Cameron, would establish a state-owned cement plant to supply all the cement needed for highway and other state uses. Convict labor would be employed.

Final legislative approval was given a bill designed to save Texas employers $10,000,000 a year in unemployment insurance taxes. Changes were made in the law to reward employers for stable pay-rolls.

*Washington.*—One Senate bill would provide further regulation of the manufacture, sale, transportation and use of explosives, while another would prohibit blasting in inhabited localities without notice. Both were referred to committees.

A House bill, referred to the Committee on Labor and Labor Statistics, would provide a state wage-hour law.

*Wisconsin.*—An Assembly bill would provide for a state cement plant, while a Senate measure would regulate the manufacture, sale, distribution, use and possession of explosives.

*Wyoming.*—A new House bill would authorize a study of occupational diseases by the state board of health, while another would provide a state labor-relations act, patterned after the national Wagner act.

The Anchorage plant. Steam at right shows location of the 2-drum hoist.

Winter scene at the plant.

# PRODUCING AGGREGATES IN ALASKA

**By ARTHUR F. WALDRON**
**General Manager, Anchorage Sand & Gravel Company**

THE 1939 census showed that the city of Anchorage, Alaska, had a population of about 4,000. Since then the United States government has started the construction of an Army air base, which has caused an influx of about another 3,000 which is more or less transient.

During the three years we have operated our plant we have furnished materials for a grade school, hospital, federal building, a street-paving job, and we also furnished sand and gravel for the Army air base until it put its own plant in operation.

We have a period, from some time in November until about the first of May, during which weather conditions make it impractical to operate our plant; also very little construction is undertaken during this time.

We do excavating and ditching, for which we have two 10-B Bucyrus-Erie ⅜-cubic yard gas shovels, and also plan to install a ready-mixed-concrete plant this coming season, using one or two 2-cubic yard truck-mixers.

Our plant is small, with a capacity of less than 200 cubic yards in 8 hours. We find this to be adequate to supply the market, as during the peak season we have ample daylight to be able to operate two shifts for about three months, with no need for artificial lights. Also, our market is limited to the requirements of the City of Anchorage and individual enterprises, as the air base is being constructed by the Construction Quartermaster Department which has all its own equipment including a very complete washing plant, and all road-work outside the city is done by the Alaska Road Commission, another government department. All our roads are gravel-surfaced with pit-run materials.

Our plant is located on a small creek about 1½ miles from the center of town. We dig directly from the creek with a 1-cubic yard, 700-foot span, slack-line cableway. The deposit is quite shallow, but the supply is being continually replenished by the swift-flowing stream and frequent freshets.

Practically none of the rock is larger than 4 inches; about 80 per cent. passes the 1½-inch square screen, and the proportions of sand and gravel from 1½-inch minus keep quite even. Therefore, since there is as yet no market for crushed rock, we have been disposing of this oversize for fill purposes or stock-piling, in hopes of a possible future crushed-rock market.

Mr. and Mrs. Waldron dress in eskimo-like garb in the winter.

Our mast is 85 feet in height and is built of local spruce, the corners being made of three 2-inch by 6-inch rough timbers, laminated and nailed with 20D galvanized nails. All four corners are framed into an 18-inch by 18-inch timber at the base, the lower end of which is incased in a metal shoe, which rests on a metal plate on the top of the concrete footing. Both the shoe and the plate have a hole in the center, through which a 2 15/16-inch steel shaft extends up about 3 feet into the 18-inch by 18-inch timber and down into a 3-inch pipe set in the concrete footing. This allows the whole mast to swing freely at the base.

The ledgers and braces are 1½-inch by 6-inch rough; the ledgers are 5 feet apart, and all are nailed with 12D galvanized nails.

There is a set of ½-inch cross rods at each set of ledgers, which extend through the corner posts, and a 2-inch by 2-inch angle-iron clip. This not only strengthens the tower but prevents any of the braces or ledgers from working loose.

The head block consists of a 12-inch by 16-inch timber 5 feet long, reinforced on both sides with ½-inch steel plates.

The reason for building this type of tower was that we could procure the materials we used from the local sawmill, and cut from smaller timber than would have been necessary for a spar or large-timber framing.

The 1-cubic yard Pioneer bucket that empties into an overhead dump hopper

is powered by a two-drum, steam hoist. Local steam coal is used.

All the materials are fed through a manually-operated gate, on a stationary, sloping-screen grizzly, which removes all the oversize. We have tried to devise a mechanical feeder that will successfully give an even flow of materials to the grizzly. We tried one make designed for this particular condition, but it did not prove successful. Any opening large enough to allow 4-inch rock to pass through, also allows the water and fines to flood over when the bucket dumps into the receiving hopper. The oversize is fed down a metal chute into a bunker from which it is removed by trucks.

Jets of water are sprayed on the materials as they drop on the grizzly, and as they roll down. This water washes the sand and gravel down a chute into the revolving screen, where more water

The cableway bucket. Note the gulls in foreground.

is applied. Sand and water pass through the first two sections of the screen and into a paddle washer that cleans the sand by agitation, drains off the water, also serving as a conveyor to transport the sand to the sand bunker.

As we have an excess of pea gravel, the lower section of the rotary screen is equipped with ⅝-inch wire cloth. From this we take a small portion of material that passes down a chute into a bin built between the slopes of the sand-and-gravel bunkers. We dispose of this to the local concrete-products plant.

The remainder of the pea gravel drops into the gravel bunker directly below, and mixes with the coarser gravel which drops off the end of the screen.

We have two 25-cubic yard metal bunkers for sand and gravel. All the materials are taken from bunkers by trucks and hauled direct to the jobs or the batching hopper or are stock-piled at the plant.

For our ready-mixed-concrete plant we plan to construct four bunkers, with the two gravel bunkers having a capacity of about 80 cubic yards each. With this arrangement we can mix from one set while filling the others directly from the plant. This will give the materials an added chance to drain and make it easier to control the moisture content.

Water is supplied by a 4-inch centrifugal pump driven by a 10-horsepower electric motor. The washing plant is powered by a second 10-horsepower motor set on the same level as the screen and sand-box. We are increasing both our water-supply and the pressure on the jets by the installation of a 2-inch, 1,800-r.p.m. pump, driven by a 3-horsepower electric motor.

The batching hopper shown in one of the pictures was used on the paving job and the federal-building job by the contractors. It simply served as a means of measuring the proper quantities of aggregates for a 3-sack mixer. The trucks were partitioned, each section holding the proper amount of sand and gravel for one batch. They dumped directly into the mixer on the job.

The conveyor which feeds aggregates to the concrete-mixing plant and the 460-foot high cableway head tower.

## Shasta Dam (from page 49)

ably more than that amount. Concrete is being placed in the dam by means of seven 20-ton cableways with movable tail towers radiating from a 460-foot stationary steel head tower.

The Columbia Construction Company is affiliated with the Henry J. Kaiser Company, which in turn is affiliated with the Permanente Corporation [1] which is supplying 5,800,000 barrels of cement for Shasta Dam. Henry J. Kaiser is at the head of all these interests. Harry P. Davis is project manager for both the Shasta and Permanente plants and divides his time between them. W. A. Beach is general superintendent of the Shasta gravel plant, Ed Carpenter is plant superintendent, Olaf Hogan is pit superintendent and "Mickey" Beeby is in charge of the conveyor system to the dam. All of these men were formerly connected with the aggregate-producing operations at Coulee Dam.

[1] See *Permanente—Newest Name in the American Cement Industry*, PIT AND QUARRY, December, 1940, pages 27-30.—ED.

Left to right: J. F. Meissner, Robins Conveying Belt Company; W. C. Harris, Harristeel Products Company, New York; J. W. Meckenstock, Meckum Engineering Company, Chicago; L. F. Hart, Wabash Sand & Gravel Company, Terre Haute. This picture, taken at the National Sand & Gravel Association convention, appeared in the February issue with Mr. Harris incorrectly identified.

# LAWS PERTAINING TO SALE CONTRACTS

IT is well recognized among persons experienced in law that the average official or executive who has accumulated a fair amount of elementary legal information may readily escape a great majority of litigations which otherwise would not be avoided. The reason for this rule is that generally both litigants believe themselves justified in entering the courts. Obviously, however, one is doomed to disappointment. With proper and elementary legal knowledge this one will not incur the heavy expenses of court trials, or he will prearrange his business plans to avoid disastrous legal controversy. Moreover, by reference to the higher-court cases referred to in these pages readers may readily have at hand records of decisions involving all points of the law, and particularly such subjects as sale contracts involved in a great majority of legal controversies.

*Law of Guarantees.*—Obviously, when a purchaser refuses to pay for materials he believes that he has valid reasons for doing so. Generally speaking, his reasons are based upon verbal statements, or written clauses, pertaining to the quality of the goods and he will endeavor to prove to the court that the quality of the merchandise was not equal to the guarantee given by the seller.

When the litigation involves an "expressed" guarantee, or one given by the seller in words or writing, the courts will interpret the exact extent of the guarantee and then consider testimony relative to the actual quality of the delivered goods, before rendering its verdict, in order to determine whether the quality of the delivered goods equalled that guaranteed.

However, a great majority of litigations, involving mineral products, do not relate to "express" guarantees but pertain to "implied" guarantees.

Therefore, it is important to know that legally an implied guarantee *never* is agreed upon by the parties to a contract. It is *not* a contractual obligation, but a common-law right invocable by one of the parties under various circumstances consistent with the present legal policy of "right is might." In other words, the courts assume the existence of an implied contract. Its origin and use are to promote high standards in business and to discourage dishonest dealings. It rests upon the principle that "honesty is the best policy," and it contemplates business transactions in which both parties may honestly profit.

The law presumes every person, firm and corporation to be honest and trustworthy until proved to the contrary. Frequently, the character of dealings is such that one party to an implied contract is compelled to rely upon the honesty of the other. Under these circumstances the courts imply a warranty on the part of the former that he will perform the assumed or actual obligations, as well as those obligations which should by right be fulfilled.

In other instances courts have held that sellers of mineral products impliedly warrant that the goods sold are fit for the general purpose for which they are sold, as well as for the buyer's *special* purpose.

*Seller Not Liable.*—On the other hand, the higher courts will not hold a seller liable on an implied guarantee if the testimony shows that an implied guarantee is not justifiable.

For illustration, in Hyde Construction Company *v.* Stevenson, 72 Pac. (2d) 354, it was disclosed that Stevenson, the owner of a gravel pit, filed suit against the Hyde Construction Company to recover $1,600 as the purchase price of gravel bought by the latter under a contract. It was alleged that the Hyde company entered into a contract to purchase 8,000 cubic yards of gravel at 20 cents per yard, according to the terms of the contract. The Hyde company admitted the contract, but claimed it was abandoned and rendered void because there was an implied warranty that the gravel in question would meet the highway department specifications, and that this test failed. In other words, the Hyde company contended that Stevenson warranted the gravel to be of sufficient quality to meet the specifications and requirements of the highway department because he knew the purpose for which the Hyde company purchased it.

As above stated the higher courts ordinarily will imply that a seller guarantees that merchandise, such as mineral products, is suitable for the intended purpose. However, this rule is applicable only when the seller knows the purpose for which the purchaser intends using the material and the purchaser is not familiar with the quality of the merchandise, and has no opportunity to inspect it. If the purchaser intends to resell the merchandise, the seller is not obligated by an implied guarantee if he has opportunity to inspect the merchandise and also knows the quality expected by the user. Therefore, in view of this law the lower court refused to hold Stevenson liable on an implied guarantee and held the Hyde company liable for payment for the gravel. This higher court upheld the verdict of the lower court and said:

"In support of this contention the defendant (Hyde Construction Company) cites numerous cases as authority for its position in contending that there was an implied warranty of fitness of this gravel for the purpose sold. However, it is to be noted that in all these cases the buyer was relying upon the judgment of the seller. Such is not our case here, for the record reflects that the defendant made the contract and that the plaintiff did not offer his judgment, but allowed the defendant to act as he deemed best. In fact, the defendant did not make a contract until after tests had been made. The lower court was warranted in its holding as to the evidence as well as to there being no implied warranty by the seller here such as to void the contract in question."

*Inspection Rules.*—Since the court will not imply a guarantee on the part of a seller of mineral products when the testimony shows that the purchaser had opportunity to inspect the quality of samples of the products, or the actual products themselves, it is important to observe the modern rule as to when the inspection shall be made. The modern higher courts hold that where parties to a contract for the sale and purchase of minerals provide for inspection without designating the place at which to make it, the general rule is that the place of delivery is the place of inspection. Moreover, if a buyer accepts and uses quantities of goods at different times without inspection, though having opportunities for inspections pursuant to contract, he is liable for the contract price, although the quality of the products is not as good as he expected.

For illustration, in Wheeler *v.* Dietz Hill Development Company, 279 N. W. 157, it was shown that the owner of a quarry sued a purchaser for the contract price of rock. The purchaser contended that he was not liable because the rock was not acceptable by the government inspectors and, furthermore, he had no opportunity to inspect the rock until it was delivered by the owner of the quarry. Notwithstanding this contention, the higher court held the purchaser liable for full payment, and said:

"The contract does not specifically designate a place of inspection. In

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**By LEO T. PARKER**

view of such an omission, inspection is at the place of delivery, according to the general rule. 55 C. J. 423. There is evidence that quantities of rock were quarried, removed and used by defendant (purchaser) without inspection of government engineers at the quarry, though opportunity therefor was given at that place. Liability for the contract price was therefore created."

*Record of Cases.*—Since many readers may desire a record of leading higher-court cases involving different points of law with respect to guarantees, the following citations are important:

It is well settled that on a sale of mineral products there is an implied warranty that they are fit to use. If the sale is made by the producer, there is an implied warranty that the products are free from defects arising from the mode of preparation and reasonably free from foreign matter. But if a particular kind of rock is purchased by name, the warranty implied is only that the rock is of the kind designated and there is no warranty that the rock is fit for the intended purpose. See also Roman *v.* Bressler, 32 Neb. 240, 49 N. W. 368; Hazen *v.* Wilhelmie, 68 Neb. 79, 93 N. W. 920.

A purchaser who would hold the seller liable on an implied warranty of the type of gravel or sand sold can not mix with it other material of a kindred nature and then be heard to complain that the quantity was not of the type which should have been delivered by the seller, or that it should produce the same results as if the material supplied by the seller had been used exclusively. See Western *v.* O'Brien, 194 Pac. 72.

In order for a purchaser of mineral products to hold a seller liable for an implied guarantee the purchaser must properly use the material and, also, the testimony must prove that the purchaser had no opportunity to make inspection or, if he did make the inspection, he was not familiar with the quality and relied upon false statements made by the seller. See Abbott *v.* Peppers *et al.* 157 Okl. 300, 12 P (2d) 203; Barnard *v.* Kellogg, 10 Wall. (77 U. S.) 383.

*Law of Inspection.*—It is well established that a buyer who inspects mineral products, or samples of stock, before entering into a contract of sale, is put on his guard and he is expected by the law to use his own good judgment with respect to the quality, quantity, and other characteristics of the merchandise. For illustration, in the very recent case of Cochran *v.* Peoples, 4 S. W. (2d) 515, it was shown that a prospective buyer thoroughly inspected granite. Also, he was experienced in judging the quality of this particular material. Later the purchaser attempted to rescind the contract on the grounds that he believed there was a greater quantity in the lot than were delivered to him, and that the seller had orally stated the quality to be better than the goods actually delivered. Notwithstanding this testimony the court held the purchaser bound to fulfill the exact terms of the contract, saying:

"In order to vitiate a contract of sale on the ground of fraudulent representations, such representations must relate to an existing fact material to the contract and upon which the other party had a right to rely and did rely to his injury. If the means of information as to the matters alleged to be misrepresented are equally accessible to both parties, *they will be presumed to have informed themselves;* and if they have not done so, they must abide by the consequences of their own carelessness."

*Experience of purchaser.*—It is well-settled law that if a purchaser is not sufficiently experienced to judge with capability the quality of the products he inspects, or if he relies upon a fraudulent statement made by a seller or an authorized agent, he may rescind the contract and the seller is liable in damages for the financial loss incurred by the buyer, as a direct result of the discrepancy. Yet, it is certain that a purchaser can not rescind a contract of sale on the contention that the seller or his agent made false statements upon which the purchaser did *not* rely, because under these circumstances the buyer is not deceived. Moreover, it is equally well established that any statement made by the seller regarding his honest opinion can not be used as evidence in later litigation to prove that the seller made false statements.

*Necessary to Show Deceit.*—A seller is not liable for fraud or a guarantee where he merely states his own opinion, or makes a problematical statement, or purposely utters a false assertion upon which the buyer did *not* rely. However, it is conversely true that a seller is deemed by the law to have practiced fraud and deceit by any act, or failure to perform an act, resulting in the purchaser being deceived to an appreciable degree. This point of the law is well illustrated by the fact that various courts have held that silence on the part of a seller is deceit, when by speaking up he could have prevented the purchaser from being deceived.

For instance, a recent higher court held a seller of sand liable for fraud where it was shown that he purposely remained silent about the quantity of foreign materials in the sand, thus deceiving the purchaser who was not sufficiently experienced to judge the quality of the sand when making the inspection. This court in effect said:

"A seller of merchandise may not do anything to conceal from the buyer a material fact affecting it, or say or do anything to divert or forestall an intended inquiry by him, or deliberately hide defects, for in so doing he is not merely remaining silent, but is taking active steps to mislead." (134 Atl. 62)

*Right to Conceal.*—It is well established that a purchaser may legally and without liability cancel any contract of sale obtained by a seller as a result of direct or indirect fraud, misrepresentation, coercion, undue influence, duress, or threats, or where the contract is made without proper authority of the purchaser's employee, or while an authorized purchaser is mentally deficient, intoxicated, under the influence of drugs, or under legal age. Very often purchasers who desire to cancel a contract of sale for mineral products present unique excuses to justify cancellation of an order or rejection of the shipment. One common source of controversy is where a buyer endeavors to cancel a contract and contends that he was not fully informed of the contents of the agreement when he signed it. However, it is well established that a contract is not rescindable, although it is proved that the complaining party was mistaken regarding the obligations.

An illustration of this phase of the law is found in the late case of Dixon *v.* Morgan, 285 S. W. 558. In this case it was shown that a purchaser signed a contract of sale for gravel without taking the necessary caution to read it carefully. This court explained that the general principle of the law, which runs through nearly all the cases of this character, is that a contract made through mistake of one party will be cancelled *only* when it can be done *without* doing injustice to either person.

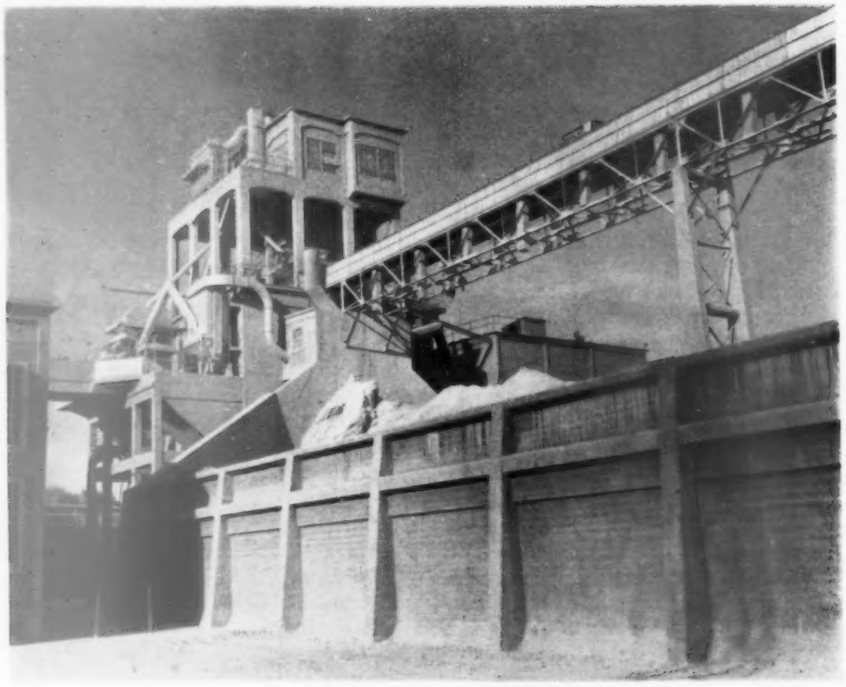
In another recent case (298 S. W. 918) it was shown that a purchaser negligently signed a contract of sale without reading it. Later he refused to accept the merchandise on the contention that he had discovered that the instrument contained certain stipulations that were not called to his attention by the seller when the contract was made. In the resulting litigation the buyer contended that he was mistaken in his understanding of his obligations and that he was deceived because the seller failed to explain the details of the obligations. Notwithstanding these contentions the court held the buyer required to fulfill the contract, and said:

"In the absence of fraud, misrepresentation, or concealment, the rule is well established that one who can read and who signs a contract without reading it, and under circumstances which do not preclude an exercise of due diligence upon his part to ascertain the contents of the contract, will not be heard afterward to say that he did not

*(Continued on page 60)*

By W. E. TRAUFFER

# Southwestern Is Making Improvements at Its Victorville and El Paso Plants



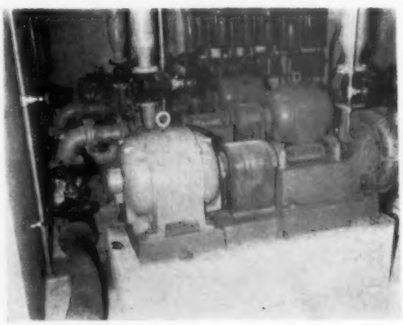
The Victorville crushing and screening building with conveyor and storage at right for the intermediate size of stone which forms the main raw-mill feed.

THE Southwestern Portland Cement Company has for the past few years been carrying on, at its Victorville, California and El Paso, Texas plants, improvement programs which have kept them in step with the progress being made in production methods and product quality. The El Paso plant was built in 1910 by the late Carl Leonardt and was one of the first in which concrete was used wherever possible. This plant was originally built entirely of concrete and the use of this material is one of the main reasons why this plant even now presents a better appearance than many plants which were built much more recently.

The Victorville plant was built in 1916 and the third plant at Osborn went into operation in 1925. These plants are also built almost entirely of concrete.

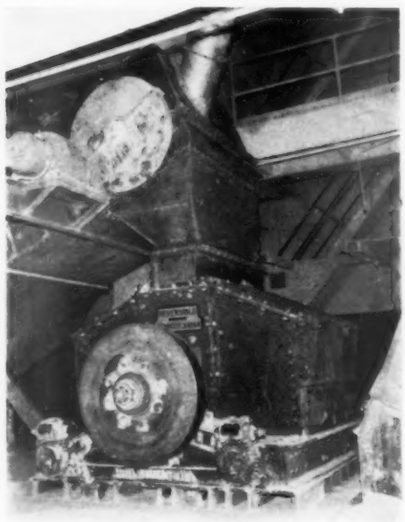
The improvements made at Victorville in recent years have affected practically every department of this plant. Beginning in the quarry, trucks were installed to make selective quarrying possible. These trucks haul the stone to the railroad siding where it is dumped into 10-ton skips of which three are mounted on each flat car. A locomotive hauls these cars 5½ miles to the plant. In the quarry three trucks are doing the work formerly done with two locomotives. Loading is done by a Marion 4101 electric shovel with a 2½-cubic yard dipper and a Marion 490 electric shovel with a 3-cubic yard dipper. At the plant the trains are pulled into the crusher building on a trestle. An overhead hoist dumps the stone from the pans into the Allis-Chalmers 60- by 48-inch jaw crusher.

In 1939 the scalping and secondary crushing departments were rebuilt and new equipment was installed. Now the minus 6-inch stone from the primary crusher is discharged on a Robins live-roll grizzly with ¾-inch openings. The oversize is fed into the new Pennsylvania C13-48 reversible hammer-mill by an inclined pan feeder. This hammer-mill is driven by a 450-horsepower Westinghouse Type CW motor through a Fast's flexible coupling. The product of the hammer-mill and the grizzly "throughs" are elevated to a 5- by 14-foot Allis-Chalmers 3-deck screen. The plus ¾-inch stone is returned to the hammer-mill.



The four 3-inch pumps which are used for all slurry handling in connection with the thickeners.

The dust passing through the 10-mesh bottom deck of this screen goes into a bin, from which it is fed to one of the mills in the raw-grinding department. As about 30 per cent. of the raw material is dust, this separate treatment of the dust has added greatly to the efficiency of this department.



The reversible hammer-mill used for final reduction of the stone. Its pan feeder is at left.

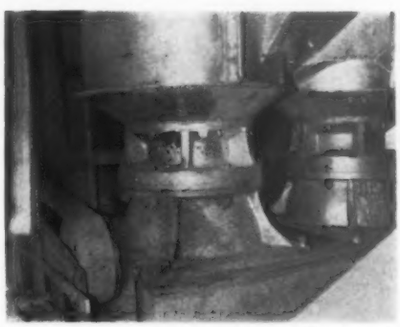
The 1/10- to ¾-inch intermediate size from the screen is stock-piled and forms the main raw-mill feed.

The new hammer-mill with its accompanying equipment has been responsible for an improvement in conditions throughout the entire raw-material-grinding department. A finer product is being made and the capacity has been increased. A bag-type dust-collector is connected to the equipment in this building.

Careful planning made it possible

The two new 80-foot-diameter slurry thickeners which reduce the moisture-content of the slurry from 38 per cent. down to about 33 per cent.

to rebuild the crushing department with a loss of only 4 days' operating time. The new hammer-mill had to be located in the spot occupied by the one it replaced. Because the foundation bolts of the old mill did not coincide with the holes in the new mill, it would have been necessary to tear out the old concrete foundation and pour a new one. As this would have meant a delay of at least two weeks a quicker method was adopted. An adapter was made which consisted of two 1-inch steel plates welded to and separated by vertical steel-plate ribs. Holes were



The two 20-inch crushers which reduce the clinker before it goes to the finish mills.

bored in the bottom plate to fit the existing foundation bolts and in the top plate to fit the holes in the base of the new mill. No trouble of any kind has been experienced with this arrangement.

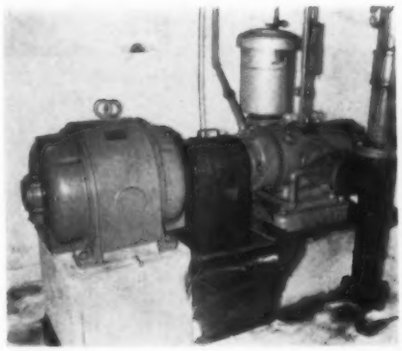
Early in 1940 two Dorr 80-foot diameter slurry thickeners were installed to improve the kiln feed and triple the slurry-storage capacity. The original installation consisted of sixteen 700-barrel concrete tanks of which 4 were used for kiln feed and the other 12 for slurry blending and storage. Wilfley pumps are used. These tanks are used for slurry correction or for feeding slurry to the kilns for small orders of special cements.

The corrected slurry, containing 38 per cent. moisture, is pumped to the "A" thickener, which has a capacity of 12,000 barrels. No air agitation is used and the mechanical agitator is operated only intermittently. During the settling periods clear water rises to the surface. This water is decanted by means of large adjustable funnels controlled by hand winches mounted on the bridge. The water overflows through pipes passing through the concrete wall of the tank about 5 feet above grade. This process reduces the moisture content of the slurry between 4 and 5 per cent., giving a kiln-feed moisture of about 33 per cent. Slurry is pumped from this tank every 24 hours.

In a concrete well between the two thickeners are four Morris 3-inch slurry pumps, two of which are spares. One of the latter is used intermittently to feed slurry from tank A to tank B. The other two pumps are use to recirculate slurry in the B tank and to feed slurry from it to the kilns. Each pump is driven by a 25-horsepower Westinghouse motor. There is also a Fuller No. 30 rotary compressor which supplies the air for agitation. It is driven by a 50-horsepower Westinghouse motor.

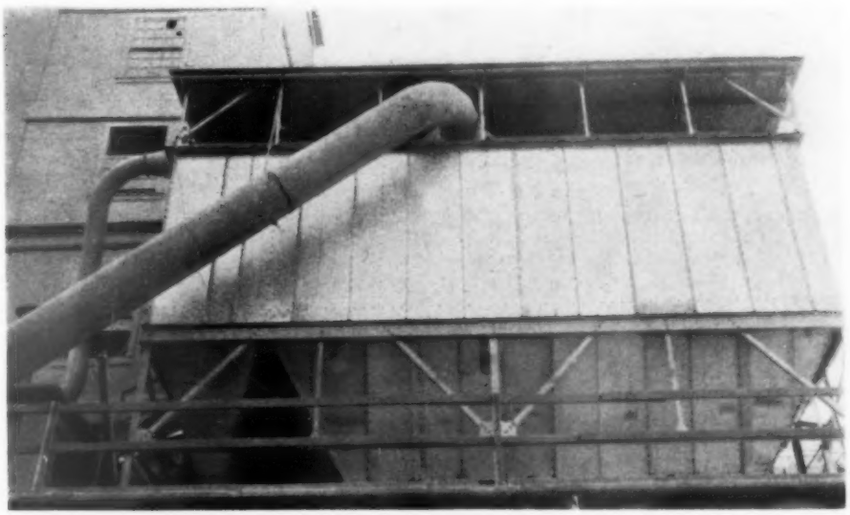
Tank B also has a capacity of 12,000 barrels and is used for the storage of kiln feed. Both air and mechanical agitation are employed continuously. Recirculation of the slurry in this tank is done by withdrawing it from the center of the conical bottom and pumping it to four points on the periphery.

This system brings the slurry down to about the lowest moisture content at which it can be pumped and has resulted in a much more uniform kiln feed. According to company officials, it is responsible for a saving of ½ gallon of 150,000-b.t.u.-per-gallon fuel oil per barrel of cement.



The rotary compressor which supplies air for agitation of the slurry in the thickeners.

In the kiln department few changes have been made since the burning zone on one of the five kilns was enlarged in 1935. Leeds-Northrup Ray-O-Tube radiation-pyrometers were installed on three of these oil-fired kilns in 1939. No difficulty has been experienced in keeping the burning temperature between 2,700 and 2,750 degrees F. These pyrometers have also made possible more even burning and have kept the



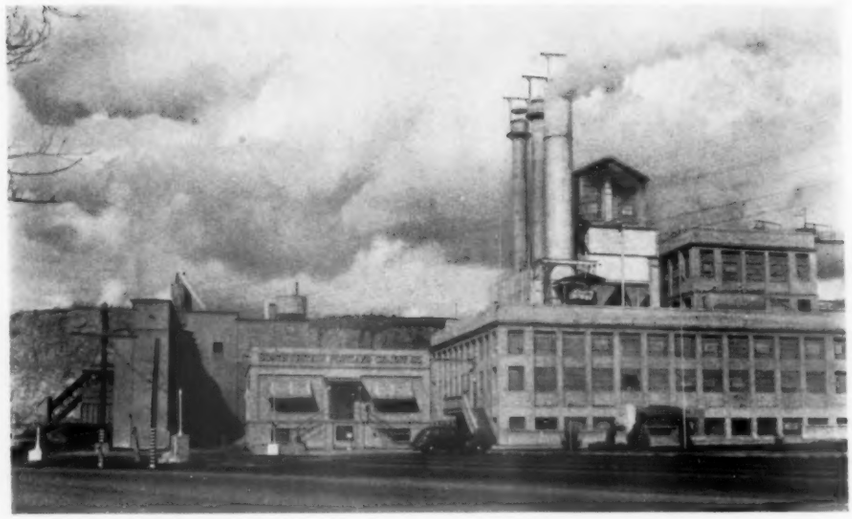
The dust-collecting system which is connected to all departments of the No. 1 packhouse and all of the equipment in it.

free-lime content of the cement down to 0.3 per cent.

Other changes made in 1939 included the installation of two Traylor 20-inch Type TY clinker crushers in place of the crushing rolls formerly used. They reduce the clinker to ½-inch size and under before it is fed to the finish-grinding mills.

The original No. 1 pack-house and the newer No. 2 pack-house were rebuilt in 1939. In the latter two bucket-elevators were installed to return the spilled cement from each of two pairs of 3-tube packers into their feed bins. Northern Blower Company Norblo cloth-bag, automatic-rapping dust-collectors were installed on each pair of packers to eliminate dust. A third Norblo collector is connected to the bag-cleaner.

As nine different types of cement are being made it was also thought important to make the packer bins self-cleaning. This was achieved by eliminating from the bins all projections or flat places which might hold back cement and by giving their steel hopper bottoms a slope of 55 degrees.



This view shows part of the plant of the Southwestern Portland Cement Company at El Paso, Texas. The office is in left foreground.

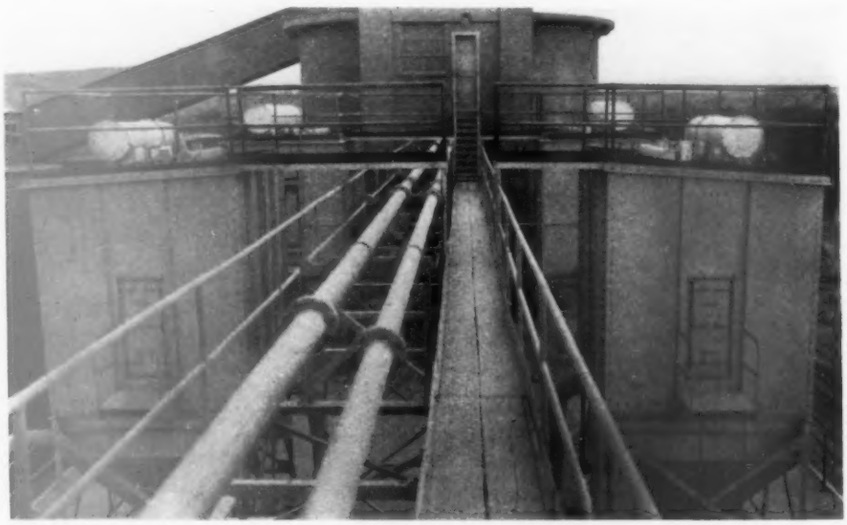
One of the packers with slat-conveyor feeding sacks on shuttle-belt-conveyor for shipment.

Similar improvements were made to the one pair of 3-tube packers in the No. 1 pack-house. In this building a Norblo dust-collector is connected to the packers, another to the silo air vents, and a third to the reclaiming screw-conveyors under the silos.

Formerly sacked cement was loaded into cars or trucks with hand trucks. Now the bags are discharged from the packers to slat-conveyors on chains with K1 attachments. The sacks are discharged from the slat conveyors on shuttle conveyors with rails, which run on stationary ball-bearing wheels equipped with electric brakes. One such system serves each pair of packers. Trucks or cars can be loaded on either side of each pack-house.

In order to derive all possible benefit from this system a method was devised to move the trucks along at the rate at which they are loaded, about 1½ feet per minute. Parallel with each loading platform is a chain in a groove in the concrete. A bar with a hook on each end is attached to the chain and the axle of the truck. Each chain is driven by a 1-horsepower U.S. Syncrogear motor which drives the chain drive-sprocket through two reductions at a speed of 8.3 r.p.m.

The hook which connects truck axle to chain which moves the truck slowly forward as it is being loaded at the Victorville plant.



The four dust collectors which are connected to the four packers, the bag-cleaner and other equipment in the new Victorville No. 2 packhouse.

With this system a crew of 5 men on two bag-packers can load a car with cement in 35 minutes. The chains allow 16 minutes for the loading of a 100-ton semi-trailer. Such a trailer has actually been loaded by a 5-man crew in 16 minutes but more time is being allowed for flexibility and to insure neat loading for long trips. This also allows for the longer time required for the loading of special cements or mixed loads. A crew of 5 men on two packers now loads more cement than was formerly possible with 8 men on two packers.

The use of this system of loading has meant an appreciable saving in truck-loading and waiting time. This

One of the 14-foot-diameter air separators which has been connected to the finish-grinding mills in the El Paso plant.

has become increasingly important with the growth of the company's fleet. All the trucks can now be loaded in time to make their deliveries the same day and be back at the plant the next morning for another load. Deliveries are being made to points more than 250 miles from the plant.

The company began making its own truck deliveries early in 1934, when a

The firing hood of the kiln in the El Paso plant which has been equipped with a grate-type clinker cooler. The radiation-pyrometer which regulates the burning temperature is also shown.

fleet of truck-trailers powered with Cummins Diesel engines was purchased. The fleet now consists of 23 Cummins Diesel-powered truck-trailers, 4 of Autocar, 16 of Sterling and 3 of Mack manufacture. According to company officials, the loading system has in effect added three trucks to the fleet.

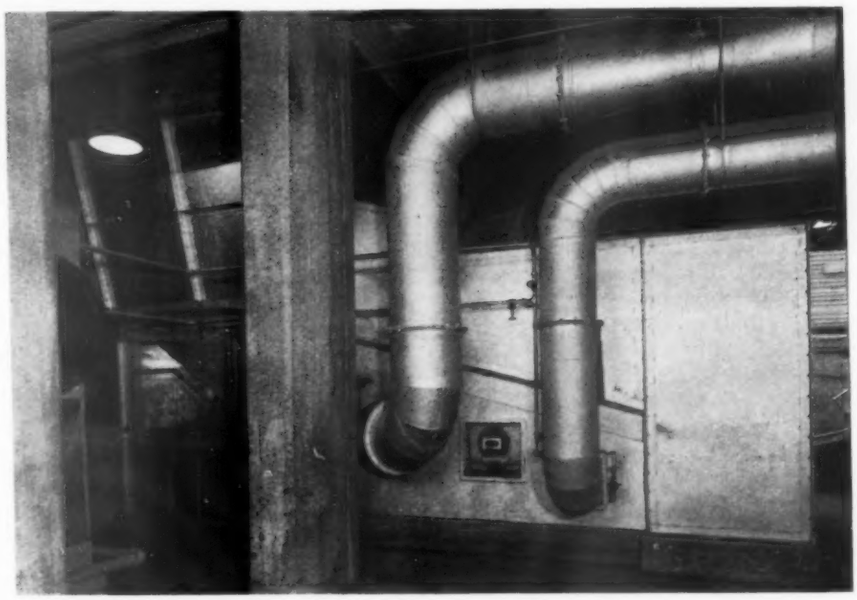
The company's plant at El Paso, Texas, is a dry-process operation with a capacity of 3,600 barrels daily. It was built in 1910. No recent changes have been made in the quarry and crushing department. The three 8- by 10- by 150-foot kilns have enlarged burning zones and are connected to Babcock & Wilcox waste-heat boilers which were installed in 1920. Each boiler is rated at 764-horsepower and the three generate all the power needed when two or three kilns are operating. When only one kiln is in operation, two gas-fired auxiliary boilers are used. The stack dust is reclaimed by a Cottrell electrical precipitator installed in 1928. Natural-gas became available in 1920 and the coal-grinding department was abandoned.

Old-style Fuller mills were originally used in the raw- and finish-grinding departments. These were replaced during the years 1921 to 1924 by combination tube-mills. In 1937 five new storage-silos of 10,000-barrel capacity each were built, doubling the existing cement-storage capacity. These silos are equipped with Fuller-Kinyon pumps for feeding and withdrawing, the air being supplied by Fuller rotary compressors.

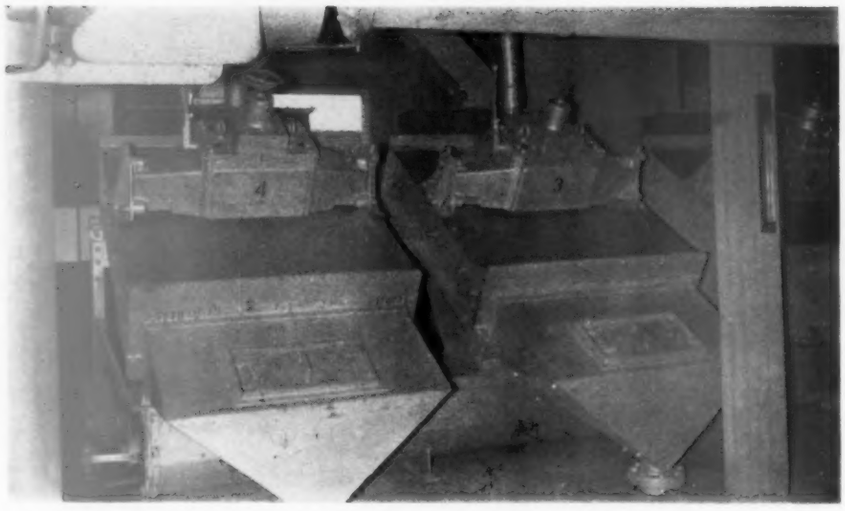
The three 6- by 36-foot-combination ball-mills in the raw-grinding department were used alone for a time. Later a 10-foot mechanical separator was installed on one of them. In 1930 a 6½- by 20-foot Smith ball-mill was installed to grind the separator rejects. Late in 1936 a 14-foot Raymond mechanical separator with a single Whizzer was connected to the other two 36-foot mills with rejects also going to the Smith

Sacked cement being loaded on truck trailers from shuttle belt-conveyor at the Victorville plant.

ball-mill. In 1937 another 6- by 36-foot mill was brought in from the coal-grinding department and this, too, was connected to the Raymond separator.



The 4- by 16-foot standard-design air-quenching, inclined-grate clinker cooler installed on one of the three kilns at the El Paso plant.

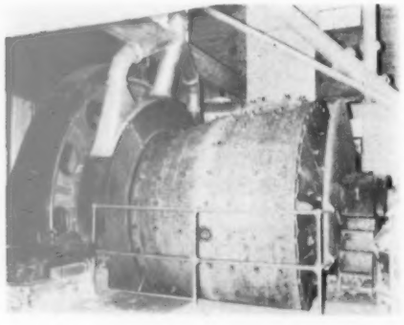


Three of the four electric vibrating-screens operated in closed-circuit with the preliminary clinker-grinding mill recently installed in the El Paso plant.

The rejects from this separator are returned to the former coal mill.

These changes and additions increased the capacity of the raw-grinding department to 172-barrels per hour when using all five mills. When only the 3-mill system is used, the capacity is 150 barrels per hour. Grinding is done to a fineness of 91 per cent. through 200-mesh.

In the finish-grinding department changes made in 1937 greatly increased both the capacity and the efficiency. An



The 9½- and 8-foot diameter by 10-foot preliminary clinker-grinding mill with dust-collector connections.

Allis-Chalmers Preliminator, 9½ and 8 feet in diameter and 10 feet long, was installed for the purpose of preparing a sized feed for three 7- by 22-foot Compeb mills which, in turn, have been connected to Ball-Peb mills. The Preliminator is in closed-circuit with four 4- by 5-foot Tyler Hum-mer screens with 14-mesh cloth. Kiln-run clinker is fed to the Preliminator by a Jeffrey-Traylor vibrating feeder and is ground to 100 per cent. through 14-mesh at the rate of 250 barrels per hour. Fuller rotary feeders are used on two of the three Compeb mills.

The minus 14-mesh product of the Preliminator is discharged through ports in the shell to a screw-conveyor followed by an elevator. A tight housing was placed around the shell over the discharge section and this is connected to a Norblo dust-collecting system. In this way air is drawn through the mill to reduce the temperature of the material and aid in the fine-grinding operation which follows.

The three Compeb mills following the Preliminator had grid division heads which were converted to Ball-Peb mills by charging the first compartment of each mill with 1-inch grinding media in place of the large balls formerly used. These three mills were formerly operated in conjunction with two 14-foot old-style separators. Late in 1940 one of these separators was replaced by a 14-foot Sturtevant separator. A second 14-foot Sturtevant separator is now being installed in place of the other old one. These separators are fed by elevators from the mills and the tailings go back to the feed ends of the mills. The product of the separators is finished cement. These separators are of the latest type and are driven direct through motor-reducers mounted on their top. Because of the necessity for mounting these separators at a certain height, they were supported from the existing floor at a point near their tops. This makes them much more accessible for inspection and adjustment than if they were supported on a frame-work from the floor below.

A 4- by 16-foot Fuller Company clinker cooler of standard design has been installed on one of the three kilns and parallel to it. A Foxboro stabilog is used to insure a fixed amount of air regardless of temperature or pressure. A drag-chain conveyor carries the cooled clinker to a grizzly, from which the oversize goes into a small screen ball-mill with ⅞-inch openings.

Before going to storage all the clinker is weighed on a device of original design. This consists of a circular feeder with three radial compartments mounted on a beam with a counter-weight which can be set for any desired weight. When a compartment is filled to the desired weight, the feeder automatically makes a one-third revolution and dumps its contents while a second compartment is being filled. Check weighings are made once each day. A revolution counter is used to count the batches and the total output is readily computed. When a sample is desired, a small car is pushed under the feeder wheel and one load is discharged into it.

The output of the other two kilns is recorded with similar equipment.

Leeds-Northrup Ray-O-Tube radiation pyrometers are used on two of the kilns to control the burning temperature. These have worked very well, holding the temperature between 2,700 and 2,750 degrees F. and effecting economies in burning and improvement in the quality of the cement.

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## Sale Contracts (from page 55)

read it and did not understand its provisions."

Another common excuse of buyers who desire a reason for avoiding obligations assumed under a contract of sale is that the seller's salesman misrepresented the merchandise. Therefore, it is important to know that a salesman's sole *implied* legal authority is to accept orders and send them to his employer for approval, and if the latter is not satisfied with the offer submitted, he may reject the proposal or simply refuse to deliver the goods. And conversely the buyer *always* is privileged to send his cancellation of the order at any time before the salesman's employer acknowledges it.

In other words, the law is that a salesman is merely a special agent, whose implied authority extends no further than to solicit the buyers' orders or proposals to purchase merchandise. Therefore, if the seller desires he may without liability reject the orders sent in by the salesman, provided the rejection is made promptly upon receipt of the order.

Moreover, this is true although both the buyer and the salesman signed the order intending to complete a valid contract of sale.

And, also, verbal promises made by a salesman have little or no legal effect in increasing the liability of his employer. This is true irrespective of whether or not the order blank contains a printed notification warning the purchaser that the seller is not responsible for verbal statements made by the salesman.

# Mining Engineers Seek to Standardize Nonmetallic-Minerals Specifications

THE Industrial Minerals Division of the American Institute of Mining and Metallurgical Engineers in its annual meeting in New York, February 17-20, devoted one important session to a discussion of the needs for standard specifications and commercial definitions for nonmetallic minerals. It was recognized, of course, that cement and aggregates and to a lesser extent lime, gypsum, and some of the other minerals are covered already. There is no intention on the part of A.I.M.E. to duplicate work on specifications being done elsewhere but rather to fill the gaps in information of consequence to both producer and consumer. Any comments on this problem of specifications and definitions will be gratefully received by Paul M. Tyler, Chief Engineer, Nonmetal Economics Division, Bureau of Mines, Washington, D. C. Mr. Tyler has just succeeded W. M. Weigel of the Missouri Pacific Railroad as chairman of the Industrial Minerals Division. H. Herbert Hughes, also of the Bureau of Mines, was elected secretary-treasurer.

The first technical session of the Division opened with W. M. Weigel and J. E. Lamar as associate chairman. The first paper covering *Detonation of Electric Blasting Caps by Dry Batteries* was presented by S. L. Windes of the Bureau of Mines. Misfires commonly occur when dry cells are used for firing, and the investigation covered by Mr. Windes was to determine the cause and propose a remedy. It is generally regarded that a current of one ampere is adequate to fire several caps, but it has been found that sometimes a cell or series of cells registering as much as two amperes fail to fire blasting caps. The reason is that two factors have been omitted from consideration. First, as the bridge wire heats up, its resistance increases greatly, and this increase is generally overlooked. In the second place, the internal and external resistance of the battery itself is much greater than is generally supposed. A simple galvanometer test may show as much as 2 amperes of current, but the effect of those two factors may reduce the effectiveness of the battery to as low as ½ ampere, which is insufficient for reliable service. It was brought out in the discussion that some companies have abandoned the use of dry cells because of their unreliability, but Mr. Windes pointed out that dry cells may be used safely if they are properly tested.

A paper on *Mining and Preparation of Hard-Rock Phosphate* by D. B. Kibler, Jr., was, in absence of the author, presented by Chester A. Fulton. The geology, occurrence, and early history of mining Florida hard-rock phosphate were covered briefly. In general, the milling process involves the use of crushers, vibrating screens, picking belts, hydro-separators, log washers, Dorr classifiers, and tables. Exports constitute an important element in hard-rock trade. Although European markets have been lost, the British blockade of phosphate exports from Morocco, Algeria, and Tunisia have opened up new compensating markets in the United Kingdom, South Africa, Australia, and New Zealand. The companies maintain stocks of phosphate up to 50,000 tons averaging in quality from 72 to 81 per cent. B.P.L. and varying in size from 48-mesh to 2½-inch.

It was pointed out in the discussion that 6 or 7 years ago, which was prior to the present setup, an attempt was made to employ agglomerate tabling. It was unsuccessful because it recovered too large a proportion of the fines that are high in iron. The iron is detrimental because it renders part of the super-phosphate insoluble. It was pointed out further that all minus 48-mesh material is discarded because it is low in phosphate and high in iron.

The third paper, *The Single-Strand Wire Saw*, by Oliver Bowles and P. de Vitry, was presented by Dr. Bowles. The conventional wire saw in general use consists of a 3-strand cable, but a new type invented and developed by Mr. de Vitry consists of a single, ribbon-shaped strand twisted to resemble a multiple-strand wire. It has high sand-carrying capacity and cuts rapidly even when worn to small size. It is now used for trimming blocks and cutting slabs of marble. Tables were presented showing comparative tests made on Vermont marble using the ordinary wire and the single-strand wire. These tests indicate that the new type of wire saw cuts nearly twice as fast as the 3-strand wire and at about half the direct cost.

It was brought out in the discussion that a hard steel having a carbon content of .15 to .20 per cent. gives best service. The most effective twist is one revolution per inch. Sharp sand is better than rounded grains, and garnet cuts about twice as fast as silica sand. It developed also that 600 pounds tension on the wire is adequate. A higher tension prevents the sand grains from getting under the wire where cutting is most effective. It was pointed out that the desirability of using a sheave 4 to 5 feet in diameter was based partly on the stiffness of the wire and partly on the fact that the welded joint is a weak spot. In answer to another inquiry, Mr. de Vitry stated that the wire had been used with some success in cutting Swedish granite.

The fourth paper, *Flotation of Barite from Magnet Cove, Arkansas*, by James Norman and Benjamin S. Lindsay of the Bureau of Mines was presented by Mr. Norman. The incentive behind the movement to develop effective methods of treating barite minerals in this region was the wide use of barite as a drilling mud, and the location of the deposit at a point 250 miles nearer to the oil wells than other commercial deposits. The barite must be ground very fine to liberate the impurities. It was ground with steel balls, sodium silicate being used as a disperser. Although the mineral had to be ground to a fineness of 100 per cent. through a 325-mesh screen, a noteworthy accomplishment was successful flotation without removal of the slimes. Cocoanut fatty acid and pine oil were used as frothing agents. The product made ran 98 per cent. $BaSO_4$ with a 90 per cent. recovery.

W. M. Weigel in discussing the paper stated that 8 or 10 years ago he studied these minerals microscopically and declared that because of the fine grinding required, they could not be used commercially. However, flotation has advanced with such rapid strides that success can now be attained. O. C. Ralston stated that although fine grinding is necessary, the material disintegrates readily. It was pointed out also that concentration is necessary in order to raise the specific gravity. The purity of the barite may be determined by a specific gravity test.

B. C. Burgess and H. I. Smith were associate chairmen at the second session of the Division.

*Burning Pulverized Coal in Direct-Fired Rotary Kilns* was discussed by R. M. Hardgrove of the Babcock & Wilcox Company. Coal is generally the most economical fuel for burning cement. It is used in 85½ per cent. of the kilns; 9½ per cent. use gas and 5 per cent. oil. Pregrinding of coal and storing it ready for use has, since 1934, been gradually replaced by direct firing of coal pulverized as needed. Of 900 cement kilns now in use, 196

are direct fired. This informative paper comprised a study of 88 plants, 28 of which have direct firing equipment. In general, direct firing involves simpler and less costly equipment, less danger from dust explosions, and more uniform firing. A difficulty is the presence of moisture in the coal. The direct firer requires preheated air taken from the kiln hood at a temperature as high as 450 degrees. Even if the moisture is removed from the coal, it is still in the inlet air and additional coal must be added to take care of it.

Some interesting points were developed on fuel efficiency. It was shown graphically that as the rate of firing increases, the output of cement clinker also increases, but at the same time the consumption of coal per barrel increases. A compromise must therefore be attained between these two factors. The paper, which is not yet available in printed form, contains much useful information on fuel efficiency in cement kilns.

A. George Stern of the Bureau of Mines described the properties and uses of modern oil-well drilling mud without which the increasing depths of holes drilled with rotary equipment could not have been possible. The most important characteristic of the mud is flexibility, the ease with which the operator can vary its properties as drilling conditions change. Mr. Stern summarized some of the requirements of drilling muds as follows: It must remove cuttings as rapidly as possible and yet have low viscosity, it must not only hold cuttings in suspension during circulation but also jell sufficiently to continue to hold cuttings when circulation temporarily ceases, it must consolidate loose formations without loss of large quantities through penetration, it must have hydrostatic pressure high enough to confine gas and prevent blowouts, it must seal the hole to prevent influx of water, it must lubricate and cool the drill bit, and it must release cuttings from the fluid at the proper time during the cycle. In addition to all these characteristics the material must be relatively low cost. It is no wonder that the production of oil-well drilling muds is now an important industry, consuming large quantities of bentonite as well as barite and other weighty materials.

Fred C. Bond of Allis Chalmers Manufacturing Co. reported that:

An improved method of measuring the surface area of a comminution product down to any desired particle size has been developed. The method is largely graphical, and requires relatively little calculation. It can be used with materials containing large amounts of clay, or excess fines of any kind.

The surface area *S* is expressed in terms of square meters per 100 c.c. of solids. This expression is based upon volume rather than weight, and is considered to be more suitable for crushing and grinding problems, where the machines ordinarily are operated under constant volume conditions.

It has the advantage that surface areas of different materials can be compared directly, even though their specific gravities may be unknown.

This paper has been printed by the Institute as Technical Publication No. 1296, "Measuring Surface Area in Grinding." Copies may be procured from the secretary.

*New Units of Crusher Capacity and Crusher Efficiency* was the title of the paper by Arthur F. Taggart of Columbia University, who proposes two units (believed to be new) for designating (1) capacity and (2) efficiency for primary and intermediate crushers.

Operators know that the tonnage of rock that can be put through a particular crusher in a given time depends primarily upon the crusher setting (open setting for jaw and primary gyratory types; closed setting for cones and rolls), and secondarily on the lithological character of the feed, its maximum size, the amount of fines that it carries, its moisture content, and the method of feeding. The proposed capacity formula states a relationship between all of these factors in one empirical equation, as follows:

$$T_R = TR_{80}KK'K''$$

in which $T_R$, called "reduction tons per hour" is the new capacity unit; T = tons of feed per hour requiring crushing; $R_{80}$ = "80-per cent. reduction ratio"; and K, K′, and K″ are constants that approximate quantitatively lithological character, moisture content and method of feeding, respectively.

The efficiency unit proposed—using the word efficiency in the broad sense of relative effectiveness—is the "reduction ton per hp-hr." ($E_C$). It is derived from the equation:

$$E_C = \frac{T_R}{P}$$

where P horsepower "consumed," which is actually energy input, since the time factor is included in $T_R$.

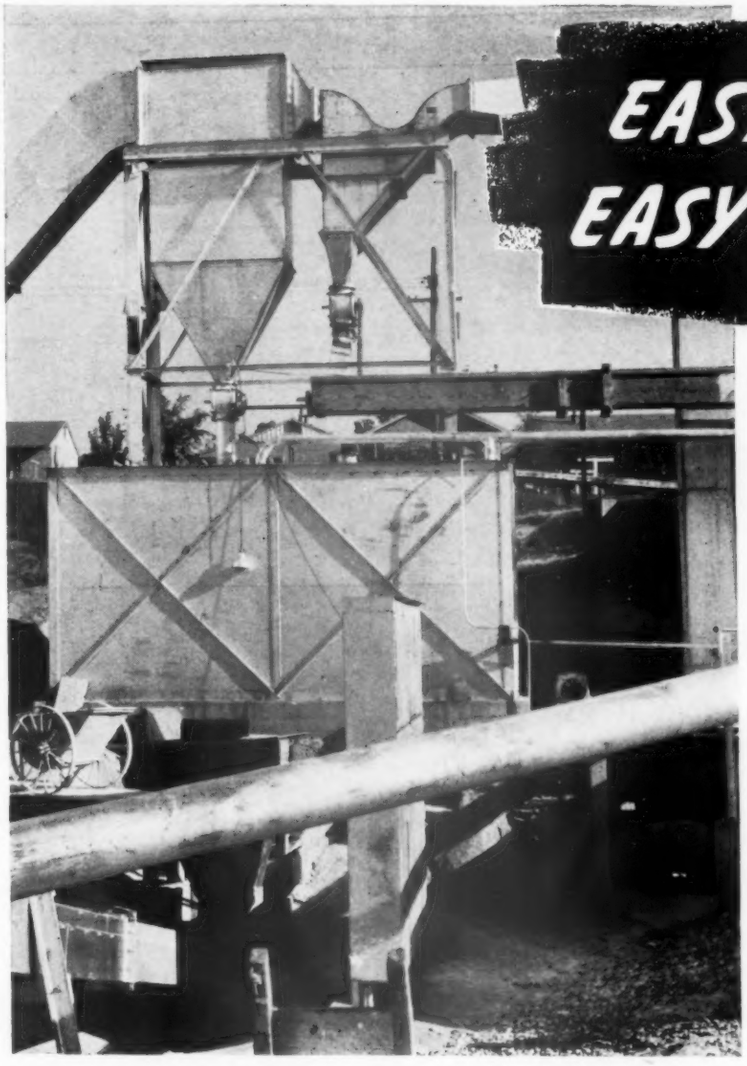
Full details regarding Mr. Taggart's proposals are given in Technical Publication No. 1297, also available from the secretary.

Thomas L. Kessler and Jerry C. Olson of the U. S. Geological Survey reported on the Survey's work on potentially strategic domestic mica. Visits to mines in the Spruce Pine area of North Carolina and New England have shown definitely that some strategic grade mica can be produced. The intermittent output of most properties is significant of the financial hazards of mica mining, but it is believed that higher prices and a condition of serious shortage would result in additional domestic production.

Samuel H. Dolbear, consulting mining engineer, reported in detail a procedure for examination and evaluation of domestic asbestos deposits. With Canada our principal supplier it would not seem that asbestos will constitute a major problem of mineral procurement but certainly the discovery of deposits of asbestos in this country is highly desirable. Mr. Dolbear observed that examination of asbestos deposits is complicated by the lack of any accepted method of "assaying" or small scale testing to determine the quality and yield of the ore.

Harold Ladd Smith of the Vermont Marble Company explained the work of the new-products committee of the New England Council, a nonpolitical group supported by voluntary subscription. The committee is fostering the development of new products, particularly those using the natural resources of the region. It is also interested in research and assists manufacturers in interpreting this research as well as other problems. The committee has made a thorough investigation of raw materials for glass manufacture available in New England and expects to demonstrate to a glass manufacturer that a plant in the area is economically feasible. Sand and gravel deposits have been tested to determine suitability of local material for highways as well as concrete for other purposes. The possibility of gravel ballast in coal barges on the return trip to ports where gravel is scarce is being looked into. The Bureau of Mines has coöperated in a study of pegmatite minerals. By-product uses of marble, granite, and slate are being investigated carefully and the prospect of a mineral wool industry in New England seems possible. The Council expects to organize a corporation to appraise new ventures in New England. It will not compete with established engineering firms but will study natural resources and expansion opportunities of existing industries, work toward establishment of new industries, and foster new inventions. The Council is particularly concerned with the long time outlook for New England industry and feels that the manufacture of products based on raw materials of New England should be more stable than merely processing plants that must bring all their raw materials into the region.

The most significant session of the meeting was a round-table conference on specifications and commercial definitions, presided over by Paul M. Tyler



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of the Bureau of Mines and R. B. Ladoo, consulting engineer. In introducing the topic Mr. Tyler pointed out the need for a clear understanding on the part of both producers and consumers of the desirable properties of nonmetals entering industrial products. In many instances materials are bought under the stipulation that the shipment should be the same as that previously supplied. This preference may harden into prejudice without either the shipper or the consumer knowing exactly why the material is satisfactory.

The first speaker of the round table was Samuel H. Dolbear who discussed the advantages of selective mining in producing a marketable product. He observed that in metal mines selective mining is an economic expediency but in nonmetals selective mining at times may be the solution of the problem of producing a salable material. He mentioned that flotation and other processes of beneficiation of nonmetals are doing away with the need for selective mining. Outstanding examples are the flotation installations treating slurry for portland cement manufacture. Oliver C. Ralston of the Bureau of Mines commented further on beneficiation with particular emphasis on the role of beneficiation in producing uniform grades of nonmetals. Other advantages also may result from treatment of various materials. Pellets made from a fluorspar flotation product are more uniform than gravel in size as well as composition and the demand for acid grade spar could not possibly be met without flotation. Feldspar, spodumene, kyanite, barite, mica, magnesite, and diatomite are other materials made marketable through flotation. Increased demand for nonmetals, more rigid specifications, and decreased reserves will further the trend toward wider use of beneficiating processes.

In discussion Mr. Ladoo pointed out that methods of beneficiation have been used actually to change the character of nonmetals. As examples he mentioned the coating of roofing granules to improve their color and durability, changing the character of fillers, and the ability now to pull clays apart and put them back together with absolute control of grain size. G. W. Jarman called attention to the fact that flotation is not the only means of beneficiation. He specifically mentioned dry scrubbing of glass sand after wet washing to remove the last bit of clay adhering to the particles. Of particular significance too is the fact that final beneficiation in the plant of the consumer is now common practice in some industries; for example, final magnetic separation of iron from titanium pigments is done immediately before use. This practice eliminates any subsequent contamination.

J. R. Thoenen of the Bureau of Mines reviewed progress in standardization of mineral-aggregates specifications, pointing out that coarse aggregates are now well covered by standard specifications that have been widely adopted by consumers and producers alike. Not as much progress has been made on fine aggregates but the need has not been as great.

B. C. Burgess of United Feldspar Corporation reviewed the specifications of ceramic raw materials. He traced the development of standard specifications for feldspar that since 1930 have saved consumers about $250,000 annually because they know what they are buying and culls are reduced. It is true that feldspar specifications are not used in all transactions but they have demonstrated adequately their worth. Specifications involve both chemical composition and physical properties. The original objectives were toward a particle size economically obtainable with available equipment and both chemical and physical properties that were a workable compromise between cost of production and consumers' needs. Mr. Burgess mentioned that flint might be treated in a similar manner but that kaolin, fire clay, ball clay, and the like will require different treatment. Significant fineness of these materials goes beyond screen tests. Chemical composition is not particularly important and even shrinkage, absorption, modulus of rupture, and fusion temperature may not indicate conclusively the usability of the clay for actual commercial purposes.

H. A. Meyerhoff of Smith College discussed dimension stone and slate. The problem of specifications of these materials is a little different because their use depends as much on architects' whims as the characteristics of the materials. It was agreed, however, that a thorough study of all kinds of stone to develop fundamental data would be useful and Oliver Bowles pointed out that much of this work has already been done at the Bureau of Standards. In discussing chemical raw materials W. M. Meyers of Pennsylvania State College mentioned that the potential significance of trifling percentages of minute constituents is just being realized, and in the chemical industries considerable detail in specifications as to undesirable and desirable content of impurities might be necessary.

In the general discussion that followed it was the consensus of those present that the Industrial Minerals Division of A.I.M.E. should proceed with an investigation into specifications and commercial definitions of the nonmetals. It is realized that mineralogical and dictionary definitions are not adequate. In addition to clarifying transactions between buyer and seller any such standardization would also be useful in problems of customs classification, freight rate disputes, and patent litigation. It was agreed of course that there would be no need to overlap work already done or in progress on aggregates, cement, lime, gypsum or the like, but it was felt that the remaining nonmetals offer ample possibilities for useful work.

A paper on milling at the Permanente Corporation cement plant by A. M. Kivari was presented in abstract by T. B. Counselman. As this plant already has been described in detail in PIT AND QUARRY no repetition is necessary here. Also on the program was a review of significant developments in Quebec's mineral industry by G. M. Schwartz of Laval University, and a description of the geologic structure and ore deposition at Cartersville, Ga., by Thomas L. Kessler of the U. S. Geological Survey.

## Construction Continues to Set New Records

Construction in the 37 states east of the Rocky Mountains continued at a high level of activity during January. The total valuation of contracts awarded, the best January figure since 1930, amounted to $305,205,000, 55 per cent. greater than the January, 1940, total.

In January, 1941, the dollar volume of commercial building was $26,944,000 compared with $15,924,000 in January, 1940, and manufacturing building was $55,948,000 compared with $12,865,000. At the same time, small home building continued to be quite active. January valuation of contracts awarded for the construction of one- and two-family dwellings was 76 per cent. larger than during January, 1940.

It is likely that the pace of private capital investment in building has been accelerated by demands outgrowing from the defense program. The noticeable increase in activity in commercial and manufacturing buildings, however, is not only ascribable to this factor, but also probably to anticipation of an upsurge this year in the demand for consumer goods which will be created by the additional income as a result of increased industrial production.

## Operates New Gravel Plant in California

Pacific Coast Aggregates, Inc., San Francisco, recently put into operation a new sand and gravel plant at Fair Oaks, near Sacramento, California. Euclid Crawler wagons were purchased to haul material from the pit to the plant.

# PERSONAL MENTION

B. F. AFFLECK, former president of Universal Atlas Cement Company, was awarded a certificate of honorary membership in the American Concrete Institute at its 37th annual dinner in Washington on February 19.

L. F. HART, general manager of the Wabash Sand & Gravel Company, Terre Haute, Indiana, won a handsome smoking stand in a contest conducted by the Cross Engineering Company at the recent aggregate conventions in Cincinnati.

ALBERT C. SHEPECK of Menominee, Michigan, is erecting a concrete products plant. Concrete burial vaults, chimney blocks, cinder building blocks and bird baths are among the products Mr. Shepeck plans to manufacture.

WALTER F. TEWS of the Tews Lime & Cement Company, has been elected second vice-president of the Milwaukee Builders' Exchange.

J. M. MATHISON and associates will soon begin development of a bauxite deposit in Henry County, Alabama, near Abbeville, according to reports.

JAMES T. PHELAN, plant manager of the Glens Falls Portland Cement Company, Glens Falls, New York, was recently appointed vice-president in charge of production. RAYMOND T. BEATON, sales manager of the same company, was appointed vice-president in charge of sales.

F. M. GARDNER has joined the Cooper-Bessemer Corporation where he will handle Diesel and gasoline-engine sales. Just prior to joining the Cooper-Bessemer organization he held a similar position with the National Supply Company.

COLBY STILSON, New York attorney, was elected a director of the Wolverine Portland Cement Company at the recent annual meeting of the stockholders at Coldwater, Michigan.

J. K. KAUFMAN, chief engineer of the Ideal Cement Company, is in charge of the new construction work going on in the Houston, Texas, plant which was recently purchased from the Gulf Portland Cement Company. Additional storage space will be created and a second kiln transferred from the Ada, Oklahoma, plant will be installed.


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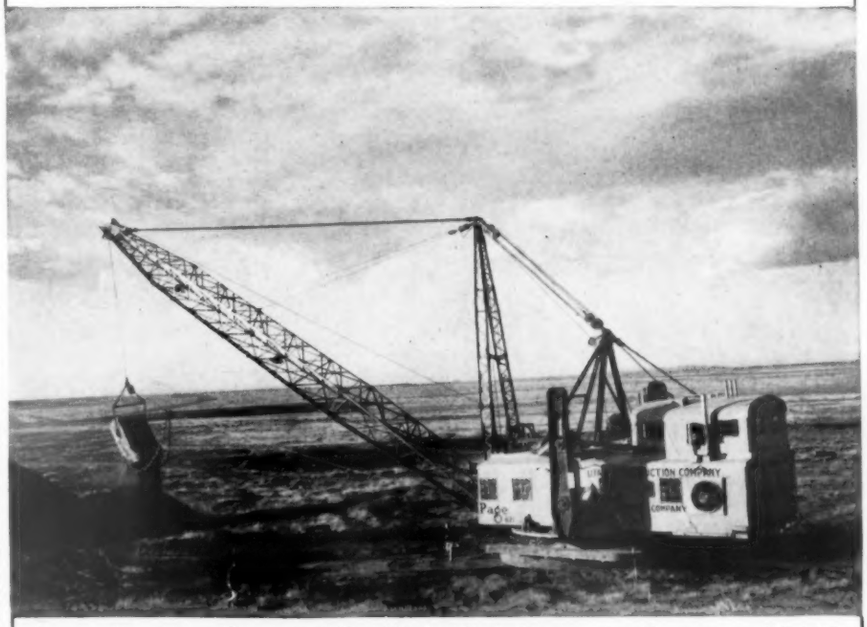

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HARRY H. POTTS, for many years identified with the concrete-products industry and who originated and developed Pottsco lightweight aggregate, and more recently manager of the Pottsco division of the Celotex Corporation, has joined the Kramer Corporation of Peoria, Illinois, manufacturer of the new Pak-Crete concrete-products machine. He will devote his efforts chiefly to advertising and general sales promotion.

FRED ROBINSON, assistant superintendent of the Universal Atlas Cement Company's Duluth plant, was unanimously elected president of the West Duluth Business Men's club at the organization's annual meeting held recently.

PAUL W. CLEVELAND, 120 South LaSalle Street, Chicago, is investigating a site in Saline County, Arkansas, on which a bauxite deposit is located with a view toward establishment of a plant there.

JAMES H. DEADERICK, who has been assistant sales manager of the western sales division of Caterpillar Tractor Company since 1939, has been appointed the company's assistant general parts manager.

H. W. NORTH, inventor and designer of Kneadermaster mixing and processing machines and engineering expert on the manufacture, use and application of such equipment, has resigned his position as consultant with the Patterson Foundry & Machine Company.

W. R. MACATEE has been appointed assistant managing director of the Asphalt Institute. He has been serving as district engineer with offices in Washington, D. C.

C. M. CARMAN, superintendent of the Universal Atlas Cement Company's plant at Independence, Kansas, was recently elected president of the Independence Chamber of Commerce.

DEAN D. CRANDELL of Buffalo, New York, was recently issued a United States patent for a gypsum plaster. The patent has been assigned to the National Gypsum Company at Buffalo.

THOMAS S. HOLDEN has been elected president of F. W. Dodge Corporation, succeeding the late Truman S. Morgan, who died December 21, 1940.

GUS NORDSTROM has sold his sand-and-gravel plant in Willamina, Oregon, to S. A. DAVIS.

NEWTON M. JONES, 74, president of the Jones Sand Company of Columbus, Ohio, died January 31 after a short illness. Mr. Jones had been in the sand business for 30 years prior to his retirement in 1931.

C. R. MESSINGER, 57, president of the Chain Belt Company, who has been continuously identified with Milwaukee and Chicago business interests for more than three decades, died suddenly of a heart attack on February 4, 1941, at his home in Milwaukee. His death followed that of Mrs. Messinger by approximately a month.

ROY A. BURCH, 53, former secretary-treasurer of the Hunkins-Willis Lime & Cement Company, St. Louis, who in recent years has been a practicing attorney, died recently of a paralytic stroke. Mr. Burch was a native of St. Louis and had been associated with the cement company for some 20 years before leaving to open a law office.

WILLIAM GARNETT PARKER, 63, operator of the West Memphis Concrete Products Company at West Memphis, Arkansas, died January 5 in a Memphis hospital after a week's illness. He was a native of West Memphis.

EDWARD A. FOLEY, a North American Cement Corporation representative for over 25 years, passed away on February 4 at his home near Albany, N. Y. after an illness of a number of months. He is survived by his widow, two daughters and three sons.

THOMAS J. DUFFY, 65, superintendent and formerly president of the Ohio River Sand Company, died recently at Jeffersonville, Indiana, after an illness of three months. A native of Jeffersonville, he had been connected with the sand company since 1906.

BRUCE FAUX, 54, superintendent of the Durland Sand Company, of West Wyoming, Pennsylvania, near Scranton, died at his home the latter part of January. Physicians said death was caused by a heart attack.

PHIL B. FREY, 75, Evansville, Indiana, representative of the Speed Stone Quarry, St. Louis, and the Louisville Cement Company, died recently from a heart attack as he was about to leave his office.

A. P. MEYER, executive vice president, of the Green Bag Cement Company of Pennsylvania, passed away a short time ago.

# FOREIGN PRACTICE

## Analysis of Manganese Portland Cements

In accordance with the German standards for the analysis of manganese-bearing Portland cements, the weak $HNO_3$-bearing solution obtained after removal of $SiO_2$ is mixed with 20 to 30 cu.cm. of a 10-per cent. ammonium-persulphate solution and heated 3 hours at 70 degrees C. to separate the manganese completely. The precipitate obtained is dissolved in nitric acid with the addition of a few drops of perhydrol and is treated again as above. In describing the above method the German standards make the following observation: "The manganese separates itself gradually as a nearly black, in the presence of iron as a more red-brown, precipitate." But this observation does not correspond with the actual situation, according to the author of the article reviewed here, Dr. A. Steopoe. One knows, he states, that, in the elimination of manganese by means of ammonium persulphate and in the presence of iron, large quantities of ferric oxide always converge with the manganese dioxide. According to his experience, a complete separation is not obtainable even by repetition of the elimination procedure.

The author describes his own test procedure for manganese determination and on the basis of his findings concludes that the description of the standards is not correct, for the manganese does not eliminate itself in the presence of iron as a red-brown precipitate but, together with the manganese, a large portion of the iron present is precipitated. And by repetition of the precipitation a complete separation is not reached; but this is necessary for a complete separation of the calcium. Since the manganese-dioxide precipitate still contains large quantities of the iron present, also after repetition of the precipitation, the German standards should be corrected in this sense.

On completion of the tests for calcium-oxide determination from manganese-bearing Portland cement, the author says that when manganese-bearing cements are analyzed in accordance with the German standards, one calcium-oxalate precipitation is not sufficient to obtain pure calcium oxide in calcining due to the great quantity of ammonium sulphate present. In this case the calcium-oxalate precipitation must be repeated in order to obtain $SO_3$-free calcined calcium oxide.

Further investigations indicate that the precipitation of magnesium must always occur in the presence of an excess of ammonia, also when ammonium nitrate is present in large quantity. The favorable influence of the ammonium nitrate is even more decided when it displaces the ammonium chloride.—*Tonindustrie-Zeitung* (1940), vol. 64, no. 60, pp. 448-449.

## Some Mortar-Binding Agents Described

Dr. Karl Goslich lists mortar-binding agents as follows:

***Kinds of Lime Not Sintered***[1]

A. Limes Which Harden in Air.

1. Fat lime *(Weiszkalk);* CaO at least 90 per cent.; MgO less than 5 per cent.

2. Dolomitic lime (gray lime) *(Dolomitkalk) (Graukalk);* CaO + MgO at least 90 per cent., MgO more than 5 per cent.

B. Limes Which Harden in Water.

3. Water lime *(Wasserkalk);* more than 10 per cent. soluble acid constituents not more than 5 per cent. MgO dolomitic. Compressive strength at least 15 kilograms; flexural strength at least 3 kilograms per square centimeter.[2]

4. Hydraulic lime *(Hydraul. Kalk);* a) natural, b) artificial; contains hy


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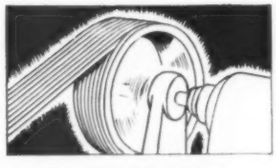

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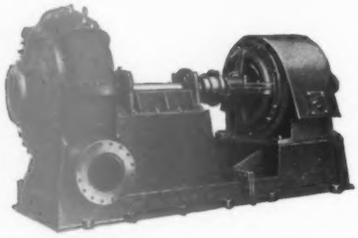
*News of interest to Centrifugal Pump Users*



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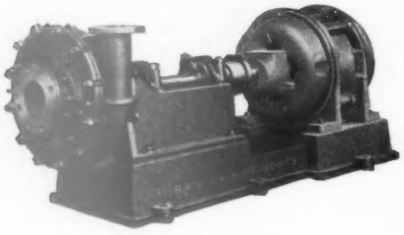

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draulic additives, but should principally consist of lime burned below the sintering limit.

All hydraulic limes; at least 15 per cent. soluble acid constituents. Compressive strengths at least 4 kilograms; flexural strength at least 5 kilograms per square centimeter.

5. High hydraulic lime and Roman lime *(Hochhydr. Kalk und Romankalk);* more than 15 per cent. soluble acid constituents, does not disintegrate by addition of water, is therefore supplied only ground. Compressive strength at least 80 kilograms, flexural strength at least 9 kilograms per square centimeter.

In transition limes the behavior in slaking and the strength are to be considered.

### Forms of Lime

a. Lump lime *(Stückkalk);* unslaked lumpy burned lime.

b. Ground burned lime *(Branntkalk);* unslaked.

c. Lime paste *(Kalkbrei),* lime dough *(Kalkteig)* sumped.

d. Slaked lime *(Loeschkalk),* powdery slaked lime, hydraulic lime *(Kalkhydrat).*

A brand of lime is accordingly designated correctly only by indicating the kind of lime and the form of lime. The designation "sack lime" *(Sackkalk)* is prohibited.

### Kinds of Cement, Sintered or Fused[3]

1. Portland cement *(Portlandzement);* intimate raw mixing, sintered, ground fine; not more than 5 per cent. MgO; not more than 2.5 per cent. $SO_3$; maximum of 3 per cent. foreign substances as additives.

$$\text{Hydraulic modulus: } \frac{CaO}{SiO_2 + Al_2O_3 + Fe_2O_3} = 1.7$$

2. Natural cement *(Naturzement);* no raw mixing, mostly foreign additives (blast-furnace slag).

3. Iron Portland cement *(Eisenportlandzement);* maximum of 30 per cent. blast-furnace slag, remainder Portland clinker.

4. Blast-furnace cement *(Hochofenzement);* 31 to 85 per cent. blast-furnace slag, remainder Portland clinker.

5. Alumina cement (fused cement) *(Tonerdezement) (Schmelzzement);* 35-50 per cent. CaO, 38-48 per cent. $Al_2O_3$, 3-10 per cent. $SiO_2$, 1-18 per cent. $Fe_2O_3$.

Strengths of the standard cements in kilograms per square centimeter:

| Mortar strength after: | 3 days water storage | 7 days water storage | 28 days mixed storage | 28 days water storage |
|---|---|---|---|---|
| Cement: | | | | |
| compressive | ... | 200 | 400 | 300 |
| flexural | ... | 18 | 30 | 25 |
| High-strength cement: | | | | |
| compressive | 250 | ... | 500 | 400 |
| flexural | 25 | ... | 40 | 30 |

The author points out that even though the building limes have been standardized, the uniform designations have not been generally accepted. The designation "lime" alone is insufficient. The subgroups of the kinds of lime are distinguished by their content of magnesia and of acid constituents soluble in silicic acid. The Roman lime, formerly designated Roman cement, is classed with the limes because it is not sintered. The limes are arranged by their increasing content of silicate formers.

Cement strengths are not utilized fully in brick walls, for in mortars the aim is not to attain maximum strengths but to attain sufficient strengths. The designation of "cement-limes" for hydraulic and high hydraulic limes is no longer used to avoid confusion.

The lime standard requires that the lime plant print one of the four prescribed directions for use of lime mortar on the lime sacks, which are as follows:

Mortar to be used at once.
Mortar to be stored damp 12 hours.
Mortar to be stored damp 24 hours.
Mortar to be stored damp 48 hours.

—*Tonindustrie-Zeitung* (1940) vol. 64, no. 59, pp. 435-436.

[1] Building limes standardized in DIN (German Industrial Standard) 1060.

[2] The strengths of the kinds of lime are determined after 28-day storage of the test specimens in damp air.

[3] Portland cement, iron Portland cement, and blast furnace cement are standardized in DIN 1,164. Natural cement and alumina cement are not standardized.

## TRADE NOTES

*1940 Performance Data and Laboratory Reports* is a new booklet just issued by Barber-Greene Company, Aurora, Illinois. It is chiefly a report on four carefully separated central plant bituminous jobs applying the continuous production principle of the Barber-Greene mixer to the "higher type" bituminous mixes. Each plant was equipped with a Barber-Greene gradation control unit for separating and proportioning three sizes of aggregate separately.

A competent private laboratory was engaged to cover each job thoroughly, and federal, state, and city engineers were invited to witness each job in operation, take samples, and make analyses in their own laboratories.

It will be of vital interest to all who are seriously engaged in specifying, producing or using the high type bituminous mixes.

---

The Acme Equipment Company, Detroit dealer in new and used equipment for plant, pit and quarry has moved its office, warehouse and yard to 14507 Schaefer Highway.

# LABOR DECISIONS

## Injunction

*Milk Wagon Drivers' Union, Local No. 753, International Brotherhood of Teamsters, Chauffeurs, Stablemen and Helpers of America et al. v. Lake Valley Farm Products, Inc., et al.,* decided by the United States Supreme Court, November 18, 1940; reported at 61 S. Ct. 122.

A Circuit Court of Appeals decision reviewed in this action held that the picketing activities of the union involved constituted a secondary boycott in violation of the Sherman Anti-Trust Act, and that for this reason the Federal District had jurisdiction to grant an injunction, regardless of the Norris-La Guardia Act, even though the case arose out of or involved a labor dispute.

The Supreme Court reverses the decision of the court below, holding that the Norris-La Guardia Act was passed specifically to curtail the equity jurisdiction of federal courts in the field of labor disputes, and that many of the injunctions which the Congress considered most objectionable were based upon complaints charging conspiracies to violate the Sherman Anti-Trust Act. "For us to hold, in the face of this legislation, that the federal courts have jurisdiction to grant injunctions in cases growing out of labor disputes, merely because alleged violations of the Sherman Act are involved, would run counter to the plain mandate of the act and would reverse the declared purpose of the Congress."

## Interpretation

*Connecticut Importing Company v. Perkins, et al.,* decided by the U. S. District Court, District of Connecticut, October 4, 1940; reported at 35 Fed. Supp. 415.

This was an action brought by a wholesale liquor dealer for a declaratory judgment to determine whether or not its employees are engaged in interstate commerce as defined in the Fair Labor Standards Act of 1938. The plaintiff alleged that the Administrator of the Wage and Hour Division of the Department of Labor, in Interpretative Bulletin No. 5, ruled that wholesalers purchasing goods from outside the state are "engaged in commerce," and that the plaintiff had been notified that it must comply with the Act.

All of the defendants except the U. S. district attorney were dismissed from the suit—the Secretary of Labor and the Administrator on the ground that they had not been served with process in the Court's district, and certain state officers on the ground that they had no power to prosecute criminal actions for the United States. Concerning the Federal district attorney, the Court rules that he is a "high officer of the United States" and not bound by the Administrator's interpretative bulletin, since it is his duty to enforce the law "according to his own conscience and judgment and not by the opinions of others, even collaborators in the Federal service." The case was accordingly ordered dismissed unless the plaintiff should amend its complaint so as to show the existence of "threats" against it and an actual controversy with the district attorney.

## Propaganda

*National Labor Relations Board v. Ford Motor Company,* decided by the U. S. Circuit Court of Appeals, Sixth Circuit, October 8, 1940; reported at 114 Fed. (2d) 905.

The National Labor Relations Board, at the conclusion of proceedings involving the Ford company, issued an order that the company cease and desist from discouraging membership in labor organizations or discriminating against union members, from threatening or intimidating union members distributing literature in the vicinity of the plant,


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from "coercing" its employees by distributing statements or propaganda against labor organizations, and from otherwise interfering with the right of self-organization of its employees.

The portion of the order commanding the employer to cease distributing propaganda is set aside by the Court and will not be enforced. The Court does not recognize a distinction found by the Board "between the right of Mr. Ford generally to express his labor views, and his right to distribute literature expressing such views to his employees in the manner adopted." "The right to form opinion," says the Court, "is of little value if such opinion may not be expressed, and the right to express it is of little value if it may not be communicated to those immediately concerned. . . . Nowhere in the National Labor Relations Act is there sanction for an invasion of the liberties guaranteed to all citizens by the First Amendment."

The other portions of the cease and desist order will be enforced. With particular reference to the intimidation of union members distributing union literature near the plant, the Court reviews the conditions prevalent during the period of "sit-down strikes" in 1937, and holds that the Ford company was justified in precautions taken to protect its plant from seizure, either by employees from within, or by others from without. The preparation made, however, was "more than adequate," and an assault (shown in the evidence) upon organizers who were ostensibly about the plant to distribute literature "was not necessary for the safeguarding of the respondent's property, nor was it provoked by the union men."

## Employee Representation

*Bethlehem Shipbuilding Corporation, Ltd., et al. v. National Labor Relations Board,* decided by the U. S. Circuit Court of Appeals, First Circuit, October 8, 1940; reported at 114 Fed. (2d) 930.

A plan of employee representation which had been in effect at one of the Bethlehem plants since 1923 was found by the National Labor Relations Board to be dominated and interfered with by the employer, and the Board consequently ordered that it be disestablished. A similar order applied to another plant where, although the representation plan has not functioned since 1937 because a majority of the representatives had joined an outside union; the order is sustained in this instance for the reason that the plan has never been disavowed by the employer.

It was contended by the employer that though a cease and desist order (against interference, domination, etc.) might as a matter of law have been proper, the Board as a matter of law was in error in finding, as it did, that an affirmative order of disestablishment was necessary "to effectuate the policies of the Act and free the employees of the respondent from such domination and interference, and the effects thereof, which constitute a continuing obstacle to the exercise by the employees of the rights guaranteed them by the Act." The Court cannot agree. "Within broad limits, it is for the Board, not for the courts, to draw the inference from the underlying facts as to what means of affirmative relief are necessary to undo the effects of an unfair labor practice and to effectuate the policies of the Act." The propriety of the disestablishment order "has been settled by controlling authority."

The General Body of Employees' Representation also asked a review of the order, partly on the ground that it was improperly denied leave to intervene in the complaint case. The Court holds that no legal error was committed, and that "it is not likely that any further light could have been shed on the matters at issue, even had the General Body been admitted as a formal party, which status it could not demand as a matter of law."

## Injunction

*Yellow Cab Operating Company v. Taxicab Drivers Local Union No. 889 of Oklahoma City, et al.,* decided by the U. S. District Court, Western District of Oklahoma, October 18, 1940; reported at 35 Fed. Supp. 403.

The employer in this case entered into a written contract with a union of its drivers, and during the term of the contract the union notified the employer that employers other than drivers had joined the union and desired a contract. The proposed new contract was not signed, the union called a strike of the drivers, instituted a picket, and threatened to picket certain hotels if they continued to do business with the cab company.

The Court (a Federal court hearing the case because of diversity of citizenship) granted a permanent injunction restraining the union from continuing the picketing, holding that the Norris-LaGuardia Anti-Injunction Act (29 U.S.C.A., Sections 101 *et seq.),* which was intended to protect labor in the exercise of its rights as defined by the laws of the land, was not intended to deprive the courts of their inherent jurisdiction nor the right to issue an injunction where facts and circumstances justify injunctive relief in order to protect property rights.

Under the circumstances of the case, including the continuance of the picketing after the company sold its taxicab business to a successor, the Court holds that the union's action in keeping a member out of employment and on picket duty, was arbitrary "and so plainly evidenced malice and a desire to injure the plaintiff in its business and property rights that it does not rise to the dignity of a labor dispute, as that term is defined by the statute."

It is also held that the employer's statement, when a wage increase was asked, that it was operating at a loss and that complying with the demand would entail further loss, did not justify the contention that the employer had refused to bargain with the union. "An employer has the right to object to a proposition for increased wages for his employees, if the proposed schedule of wages is beyond his financial ability to pay."

## Distributors

*National Labor Relations Board v. Henry Levaur, Inc., et al.,* decided by the U. S. Circuit Court of Appeals, First Circuit, October 25, 1940; reported at 115 Fed. (2d) 105.

The respondents in this case are distributors of automobiles, parts and equipment, and contented that they are not subject to the National Labor Relations Act because they are not engaged in interstate commerce and do not affect such commerce. "They insist that their business is predominantly an interstate retail business, that their interstate transactions are very small percentages of their total business, that they do not take title to the automobiles shipped in interstate commerce until they arrive within Rhode Island, and that they relinquish title to the purchaser before the car leaves the state. This, they claim, makes even their transactions with out-of-state vendors, and purchasers completely intrastate sales and removed from the regulatory power of Congress."

The Court, however, overrules these contentions and holds that the distributors are engaged in interstate commerce and that any stoppage of their business because of their unfair labor practices would obstruct or burden the free flow of such commerce. Under decided cases, "activities which when separately considered are intrastate may become subject to the power of Congress when they have a close and substantial relation to interstate commerce". . . ; "it is not in the least significant that the sales are so made that title passes to the purchaser within Rhode Island. It has long been held that a sale involving interstate transportation is not removed from Congressional regulation because the sale itself is intrastate, either before or after the transportation" . . . ; and

"the fact that the interstate transactions of the respondents are only a small percentage of the entire business of respondents is not material since the test of applicability of the National Labor Relations Act is not the percentage of business done but the effect on interstate commerce."

## No Strife

*National Labor Relations Board v. Rath Packing Company*, decided by the U. S. Circuit Court of Appeals, Eighth Circuit, October 31, 1940; reported at 115 Fed. (2d) 217.

In this review the Court sustains an order of the National Labor Relations Board directing the respondent company to disestablish an Employees' Representative Council which the Board found to be controlled and dominated by the company. "The self-organization of workers contemplated by the Act can be accomplished only in the exercise of their full freedom of association," says the Court. "If they have been drawn into association dominated by the employer, their freedom from such association must be restored in order to enable them to exercise the full freedom of association guaranteed them by the Act. Where it appears that such restoration of full freedom has been hindered by the employer and had therefore not been effected, the Board is empowered to accomplish it by an order to cease and desist and to disestablish."

It was contended by the respondent that its acts, even if it be found that it had engaged in unfair labor practices under the terms of the Act, did not in any way affect interstate commerce. The absence of strikes or labor trouble or labor disputes at the plant was said to refute the probability of interference with interstate commerce. But, says the Court, the jurisdiction of the Labor Board was not dependent upon the existence of strife or turmoil in respondent's plant. The Act declares that "protection by law of the right of employees to organize and bargain collectively safeguards commerce from injury . . . and promotes the flow of commerce" (Sec. 1(1)), and "the Board's jurisdiction" (says the Court) "is not limited to cases in which actual obstruction of commerce through labor disputes, strikes or lockouts has materialized."

## Procedure

*Saxton v. W. S. Askew Company*, decided by the U. S. District Court, Northern District of Georgia, Newman Division, November 4, 1940; reported at 35 Fed. Supp. 519.

As one of the means of securing enforcement and compliance with the Fair Labor Standards Act of 1938, Congress imposed on the employer liability to the extent of unpaid wages and unpaid overtime compensation, and an additional equal amount as liquidated damages. It provided that action to recover liability to employee or employees may be maintained "by any one or more employees for and in behalf of himself or themselves and other employees similarly situated, or such employee or employees may designate an agent or representative to maintain such action for and in behalf of all employees similarly situated" (29 U.S.C.A. Section 216(b)).

This case was a suit brought against an employer by an employee to collect unpaid wages and overtime compensation and liquidated damages "in his own behalf and in behalf of all the former and present employees" of the company. The Court construes this to require a determination only of the question of unpaid wages and overtime due the plaintiff, and not such a question with respect to all former and past employees, unless any of them should intervene in the suit. A motion for a bill of particulars, accordingly, is denied.

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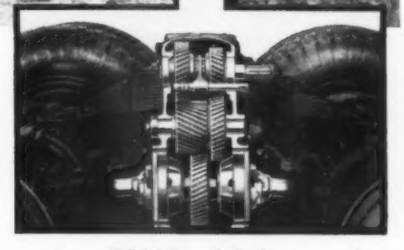

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terms of the Act with reference to the collection of unpaid compensation, that it was not the intention of Congress to broaden any of the procedural and substantial rules of class actions, and it would seem that where under the Act a suit is filed by one or more employees for themselves and others similarly situated, showing violation of the statute, but different and divergent rights to plaintiffs as a result thereof, the action is not a class action in any extent greater than permits any other employee similarly situated to intervene therein, setting up his specific claim. . . . Furthermore, it is not clear that in this kind of suit the one plaintiff alone could secure the adequate representation of all the employees, to rights accruing over a period of some two years. The allegations of the petition do not present a true class action and it is apparent that only those parties who are named and actually before the Court are involved. The action does not involve one single question of whether the law has been violated, but rather the varying rights of the employees (past and present) of defendant because of violation."

The motion for bill of particulars as to the plaintiff named is overruled on the ground that "if in fact an employer within the terms of the Act, defendant has records which will give it all information which cannot be obtained by discovery and interrogatories."


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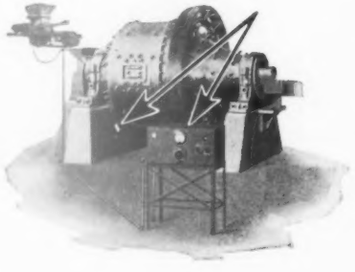

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# TRAFFIC News Digest

*Marble and Granite.*—Docket No. 28278. Barre Forwarding Company *et al. v.* Montpelier & Wells River *et al.* was dismissed. Rates on marble or granite blocks, from points in Vermont and Massachusetts to destination in Illinois, Indiana, Michigan, Minnesota, Missouri and Wisconsin, were found applicable and not unreasonable. The rates charged on "rough," "dressed," or "carved" blocks or pieces had been and were class rates subject to ratings of 22.5, 27.5, and 35 per cent., respectively, of the first-class rates. The commission stated that these ratings were found reasonable in Consolidated Stone Cases, 200 I.C.C. 65. It was said no evidence was introduced to show that the rates charged were relatively or *per se* unreasonable. The complainants contended that commodity rates were applicable and sought reparation.

*Reparation.*—Although the subject matter of this report is grain and grain products and is not directly concerned with the manufacture of crushed stone, sand and gravel, and allied products, the opinions expressed in the report should be of interest to all traffic managers. Charging that 6-per cent. interest on reparation is excessive, based on changed conditions, and asserting that 4 per cent. would be adequately compensatory, Commissioner Mahaffie, joined by Commissioner Alldredge, has partially dissented from a report of the commission on further hearing in No. 23318, Auburn Mills *et al. v.* Chicago & Alton *et al.*, embracing No. 23851, Beaver Dam Milling Company *v.* same.

The commission found in that report that reparation of $2,851.01, plus 6-per cent. interest from the dates charges were paid, was due the complainants on carloads of grain and grain products from points in Illinois, Kansas, Missouri, and Nebraska to Auburn, Beaver Dam, Bowling Green, and Glasgow, Kentucky, under findings in the prior report on reconsideration, 222 I.C.C. 495, and ordered payment on or before March 20, 1941. The Louisville & Nashville and the Illinois Central were required to pay the required amounts of reparation plus the 6-per cent. to the complainants.

In dissenting from the findings of the majority in providing for interest at 6 per cent. per annum from the dates charges were paid, Commissioner Mahaffie asserted that originally the use of that rate of interest was based on, and probably justified by, the general use-value of money rather than the exact cost of money to the individual complainant. He said that more recently the use of the same interest rate had been a matter of precedent rather than the general use-value of money. In the meantime, he added, interest rates had greatly decreased.

"In my opinion, following this precedent without regard to changed conditions has resulted, and is resulting here, in the use of an excessive rate of interest," said the commissioner. "This is equivalent to an award of punitive damages."

Commissioner Mahaffie, citing City of Danville *v.* Chesapeake & Ohio, 34 Fed. Supp. 620, said the court considered the question of the proper rate of interest to be included in a judgment in a suit on which the commission's order awarding reparation. The judgment entered there, he said, used a rate of 4 per cent. per anum from the date on which the commission ordered reparation paid to the date of judgment. He added that this finding was based on the preliminary finding that a 4-per cent. interest rate would adequately compensate shippers for damages sustained by them.

Commissioner Mahaffie pointed out that the shipments involved moved between July 6, 1928 and December 14, 1931, and said that in his judgment a rate of 4 per cent. would adequately compensate the complainants for their actual damages. Commissioners Lee and Patterson did not participate in the report.

*Sand and Gravel.*—Examiner C. E. Stiles held a hearing at Chicago, February 7, on fourth-section application No. 18,500, sand, crushed stone, and gravel to Valparaiso, Indiana, at which the applicant railroads testified in support of a present rate of 66 cents a ton on sand, crushed stone, and gravel from cities in the Chicago area, including Joliet, Lehigh and Plainfield, Illinois, to Valparaiso. F. V. Slocum, attorney for the Grand Trunk System, said the Illinois producers had obtained the 66-cent rate in 1939 in another fourth-section case based on the competition of Indiana truck operators and producers in Michigan using their own lake vessels. He said lake-truck shipments to Valparaiso took a rate of approximately 85 cents a ton, and the railroads continued to need the 66-cent rate to move the traffic.

However, it was indicated by Examiner Stiles that the application would not settle the problem as the petitioners had asked for an extension only until June 20. It was said by the applicants that the competitive situation was likely to change at any time and that by June 20 the Illinois producers might require another rate. The matter was discussed by the applicants with the examiner and L. A. Behrle, general traffic manager, Chicago Gravel Com-


PERFORATED METAL SCREENS
FOR SAND, GRAVEL STONE, ETC.

*Manufactured exactly to your specifications.*

Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices.

Prompt Shipment

CHICAGO PERFORATING CO.
2435 W. 24TH PLACE CHICAGO, ILL.
*Telephone* CANAL 1459

pany, who appeared in support of the application. After this discussion the applicants asked that the petition be amended so that permanent relief would be granted. They said they would probably publish tariffs with expiration dates as of June 20, but would change the dates to become effective later if it became certain that the competitive situation had not changed.

*Motor Proposed Reports.* — MC — 101609. Pembroke, Virginia. Omar M. Collins, Frank B. Collins and Burnett K. Garman, d.b.a. Collins and Garman, common-carrier application. Joint board 245. Certificate recommended. Cinders from Glen Lyn, Virginia, to points in Monroe and Summers counties, West Virginia, crushed stone from points in Giles County, Virginia, and marl from Narrows, Virginia, to points in Monroe county and in specified parts of Mercer and Summers Counties, West Virginia, over irregular routes.

MC—74486. Taunton, Massachusetts. Sub. No. 1, Joseph S. Rose, d.b.a. McCabe Sand & Gravel Company, extension to Rhode Island. Joint board 18. Denial of certificate proposed. Lime, cement brick, ready-mixed concrete, bituminous concrete, sand, gravel, crushed stone, and clay drain pipe between Taunton, Massachusetts, and points within a 25-mile radius thereof on the one hand, and points in Rhode Island within a radius of 40 miles of Taunton on the other.

## Central Freight Association Docket

Docket 65450 (Shipper's proposal.)—Limestone, ground or pulverized, carload, minimum weight 60,000 pounds. Establish on shipments from Hillsville, Wallford, and Shaw Junction, Pennsylvania, to Prenter, West Virginia, a rate of $2.70 per net ton.

Docket 65453 (Shipper's proposal).—Stone (crushed), crushed-stone screenings, agricultural limestone (unburned), agricultural limestone screenings in bulk, in open-top cars, carload, minimum weight 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity, the actual weight will apply. Establish on shipments from McVitty's, Ohio, to Canton and Valley Junction, Ohio, rate of $1.38 per net ton.

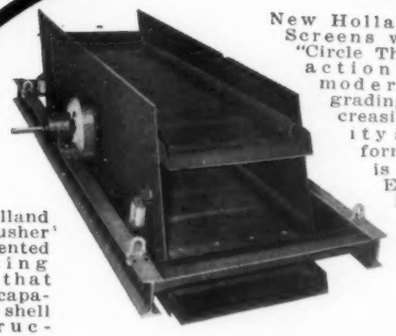
Docket 65507 (Shipper's proposal).—Stone, fluxing, furnace or foundry, melting or refractory (unburned) in bulk, carload. Establish on shipments from Durbin, Ohio, to Hamilton, Ohio, a rate of 88 cents per gross ton.

Docket 65624 (Carrier's proposal).—Cancel specific commodity rates on lime from Mitchell, Murdock and Salem, Indiana, to points in C.F.A., S.F.A., S.W.F.B., T.C.F.B., and W.T.L. territories, except that rates from Salem, Indiana, to Barton, Wisconsin, Cincinnati, Ohio, and Indiana destinations are to remain in effect. Classification basis to apply.

Docket 65654 (Carrier's proposal).—Whiting, carload, minimum weight 40,000 pounds. Cancel all commodity rates, as published in Items, Numbers 4221 to 4250 A, inclusive, Supplement 29, C.F.A.L. Tariff 105W, which rates apply from Bay City and Midland, Michigan, to Charleston, West Virginia, group. Buffalo, New York, Detroit, Michigan, Toledo, Sandusky, Leavittsburg, Perry, Barberton, Ohio, etc., to various destinations in Extended Zone C territory in Wisconsin and also to W.T.L. "Northwest" territory, Class 25, minimum 40,000 pounds to apply.

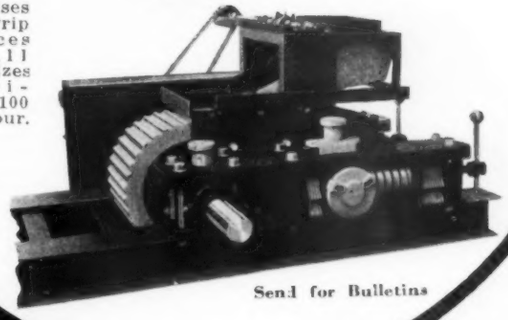
Docket 65705 (Shipper's proposal).—Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) and gravel, in open-top cars, carload. Established on shipments from Robinson, Pennsylvania, to points in Ohio and Pennsylvania, rates as shown in Exhibit C attached.


NEW HOLLAND



New Holland Screens with "Circle Throw" action have modernized grading by increasing capacity and uniformity. Above is shown the Extra Heavy Duty Vibrating Screen, available in full range of sizes —one to three decks.

New Holland Roll Crusher has patented pulsating feeder that doubles capacity. Rib shell construction increases angle of grip and reduces dust. All standard sizes —capacities up to 100 tons per hour.



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New Holland Pennsylvania

Don't Overlook 3-Point Suspension-
Extra power on the curves and grades because of Plymouth's side- and cross-equalized, 3-point spring suspension.
Look For Accessibility!
There, the Plymouth scores mighty high. You can reach any major part without removing any other major part.

Buy your next locomotive BY PRESCRIPTION!

Let Plymouth engineers *prescribe* the right locomotive for your requirements. Ask them to show how much you'll save. For real help on your locomotive problems, write . . .

PLYMOUTH LOCOMOTIVE WORKS
DIVISION OF THE FATE-ROOT-HEATH CO., PLYMOUTH, OHIO

Plymouth GASOLINE • DIESEL • ELECTRIC • BUTANE • PROPANE Industrial Locomotives

Docket 65794 (Shipper's proposal).—Sand, all kinds, and gravel, in open-top cars, carloads. Establish on shipments from Overpeck to Defiance, Ohio, a rate of $1.49 per net ton.

### Fourth-Section Applications:

Docket 18862.—Filed by Roy Pope, requesting fourth-section relief to establish rates on cement, concrete mix and masonry cement, in carloads, from Birmingham, North Birmingham and Boyles, Alabama, to Harriman, Tennessee, circuitous routes being the grounds for relief.

Docket 18871.—Filed by B. T. Jones, requesting fourth-section relief to establish rates on masonry cement mortar, cement or dry building mortar, carloads, from points in central territory to points in Michigan and Wisconsin to meet carrier competition and to maintain grouping.

Docket 18878.—Filed by W. S. Curlett, requesting fourth-section relief to establish rates on masonry cement mortar, cement, or dry building mortar, carloads, from Grove, Maryland, to points in the South to meet carrier competition. Schedules filed containing proposed rates are W. S. Curlett I.C.C. A626, Supplement 14.

Docket 18880.—Filed by R. A. Sperry, requesting fourth-section relief to establish rates on sand, carloads, from Attica, Indiana to Taylorville, Illinois, to meet wayside-pit competition.

Docket 18890.—Filed by J. R. Peel, requesting fourth-section relief to establish rates on cement and related articles, carloads, from points in Arkansas; Kansas; Missouri; Oklahoma; Texas; Portland, Colorado; East St. Louis, Illinois; and Superior, Nebraska; to points in Oklahoma and Texas to meet market competition. Schedules filed containing proposed rates are J. R. Peel's I.C.C. 3204, Supplement 20, 3039 Supplement 39, 3312 Supplement 7, 3131 Supplement 14, and L. E. Kipp's I.C.C. A—3177, Supplement 11.

Docket 18903.—Filed by L. E. Kipp, requesting fourth-section relief to establish rates on cement, in carloads, from points in Kansas and Dewey, Oklahoma, to points in Indiana and Ohio, circuitous routes being the grounds for relief.

### Fourth-Section Orders:

Docket 13981 (Supplemental). — Crushed stone to Sewalls Point, Virginia. Application 18640. Letter from A.C.L. R. R. stating that rates at intermediate now conform to long-and-short-haul provision of Section 4 and that no further relief is necessary. Fourth-Section Order 13981 entered September 26, 1940, in fourth-section application 18640 vacated and set aside, and fourth-section application 18640 denied. Effective March 3, 1941.


MOBILITY PLUS LOADING SPEED

Two great new Haiss Loaders on rubber tires—3 and 5 yards capacity—will load trucks from scattered stock-piles at bed-rock low cost.

*Ask for Bulletins 75 W and 80 W*

WRITE, WIRE OR TELEPHONE

HAISS

George Haiss Mfg. Co., Inc., 142nd St. & Rider Ave., New York

**Who, for nearly half a century, have created and sold none but equipment of demonstrable superiority in design and manufacture.**

**Portable Conveyors—Clamshell Buckets**


# NEW MACHINERY and SUPPLIES

## • Automatic Pick-up

Continually improving its line by building models to meet new conditions, Dempster Brothers, Inc., has just announced its new Model "AP" (Automatic Pickup) unit.

With the standard Dempster-Dumpster equipment, as well as with competitive equipment on the market of a similar nature, it is necessary that some form of lifting chains which are permanently attached to the hoisting mechanism be attached to each loaded container in order to pick it up, and detached from that container when placed back on the ground after the load has been discharged and the empty container is returned to the originating point.

However, with the new Model "AP" unit, this labor has been eliminated entirely. The automatic pickup is similar to the action of a fork lift truck.

## • Excavator

A new, lightweight ¾-cubic-yard convertible shovel-dragline-crane, Model 75, is announced by Link-Belt Speeder Corporation, Chicago, as a companion to its LS-85 heavy-duty ¾-cubic-yard machine.

All-welded steel construction has replaced castings in the new "75". The power plant is a heavy-duty gasoline or Diesel engine with

**The fork-lift automatic pick-up about to hoist and haul away a loaded bucket.**


The TY-ROCK FULL FLOATING CIRCLE THROW SCREEN

Coarse and Medium Sizes
Live Rubber Mountings
No Escaping Vibration

HIGH TONNAGES OF ROCK

The W. S. Tyler Company

CLEVELAND, OHIO, U. S. A.


smooth-running roller chaindrive. Alloy steel, machine-cut spur gears drive the reverse and drum shafts. These turn in heavy bronze bearings.

External band clutches enable the operator to "feel" the load at all times. This sensitivity, plus external band brakes operated by automotive type pedals, is said to result in perfect control of the load and the greatest accuracy in placement. All brake bands are instantly accessible for adjustment and can be removed easily for re-lining.

A large-diameter turntable and long, wide crawlers give the Model "75" extra stability on slopes and in heavy digging. The turntable is made of alloy steel with internal gear. A roller path machined on a bevel permits the use of large, wide-faced conical rollers that revolve without slippage. Upper and lower frames are connected by a heavy alloy steel center quill with large adjusting nut.

The new lightweight convertible excavator.

A three-piece traction shaft driven by fully enclosed alloy steel bevel gears transmits full power to the crawlers by means of heavy, heat-treated roller chains.

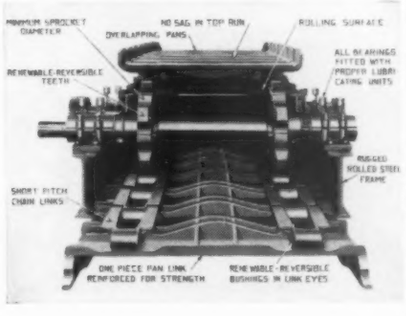
Crawler shoes are abrasion-resisting, non-clogging, lug driven, with close pin centers to insure smooth action. Added stability results from using double-faced track rollers, increasing the effective crawler width. Track adjustment is provided at both ends to maintain perfect alignment and tension.

Controls operated from within the cab permit steering in both directions, either gradual or sharp, regardless of the relative position of cab and lower base. A positive traction lock, controlled from the cab and engaging in three positions, prevents movement of the crawlers while working, eliminating any necessity for chocks or blocking.

## • Apron Feeder

Illustrated are two views of the new Robins-Oro apron feeder recently introduced by the Robins Conveying Belt Company. It is designed and constructed for especially heavy-duty service to efficiently handle large tonnages of material at high capacities. All wearing parts are made of a superior grade of manganese steel.

The outstanding features of this feeder are indicated on the cross-section picture. Ample supporting rollers are grouped at the loading point to absorb terrific loading shocks. The feeders are compact units requiring little headroom. They can be installed either in a horizontal position or, under average conditions,


MINIMUM SPROCKET DIAMETER
NO SAG IN TOP RUN
OVERLAPPING PANS
RENEWABLE-REVERSIBLE TEETH
ALL BEARINGS FITTED WITH PROPER LUBRICATING UNITS
RUGGED ROLLED STEEL FRAME
SHORT PITCH CHAIN LINKS
ONE PIECE PAN LINK REINFORCED FOR STRENGTH
RENEWABLE-REVERSIBLE BUSHINGS IN LINK EYES

Two views of the apron feeder.


RUBBER CUSHIONED POWER

SIMPLICITY GYRATING SCREENS

NON BLINDING
POSITIVE ACTION
PERFECT BALANCE

Simplicity engineers have pioneered and developed many important features in screening equipment—and offer the latest advanced design in Simplicity Gyrating Screens in all standard sizes in single, double and triple deck. See this equipment at your neighbor's plant or write for full information.

SIMPLICITY ENGINEERING COMPANY
DURAND, MICHIGAN

The Strongest Part is the Spiral Seam

– and there is PLENTY OF SPIRAL

THAT spiral lap welded seam reinforces each length of Taylor Spiral Pipe from end to end—gives it strength beyond that of any pipe of its weight. In Taylor Pipe the pitch of the spiral is carefully selected for each group of sizes to give the proper structural strength for the given pipe diameter, as shown above.

This stronger but lighter pipe can cut your costs. There is a type of joint—a type of protective coating—a size and gauge—for every service where a light walled pipe is used.

TAYLOR FORGE & PIPE WORKS
General Offices and Works: Chicago, P. O. Box 485
New York Office: 50 Church Street
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TAYLOR Spiral PIPE

# FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service

**EARLE C. BACON, Inc.**
17 John St. New York, N. Y.



IT COSTS NO MORE — TO USE THE BEST

REPLACE WITH
*"Indian Brand"*
MANGANESE STEEL
LONG LIFE
ABRASION
RESISTING PARTS
FOR
QUARRY, ROAD,
DREDGING,
AND
MINING MACHINERY

**The Frog, Switch & Mfg. Co.** CARLISLE, PA.
*ESTABLISHED 1881*

**A portable concrete-mixing plant known as the Mixermobile being manufactured by the Mixermobile Sales Company, Los Angeles, mixes and elevates concrete right on the job. As the above view indicates, the unit is mounted compactly on a truck and can be moved quickly when a change of site is necessary. Trucks discharge dry material to a loading skip, a 2-cubic yard mixer produces the concrete and a hoist bucket dumps into a hopper on the tower for loading concrete buggies or agitator trucks.**

inclined up to 16 degrees. They are made in various lengths to suit installation requirements and in different pitches.

The small feeder requires only 1½ horsepower and handles 92 t.p.h. of from 5- to 9-inch lumps. The largest handles 1800 t.p.h. of from 29- to 45-inch lumps and requires 20 horsepower. Both these capacities are based on material weighing 150 pounds per cubic foot and a speed of 10 feet per minute.

### • Locomotive

The H. K. Porter Company, Inc., Pittsburgh, has just completed a new steam locomotive which embodies several design and construction improvements over existing equipment. The new locomotive is ideal for switching and general plant use.

Designed for use on 30-inch track up to standard gauge, the new locomotive is 7 feet 4 inches wide, 10 feet 6 inches high and 22 feet 10 inches long from bumper to bumper. Four 42-inch drive wheels, connected, provide a tractive force of 26,000 pounds.

Frames are of heavy slab steel, thoroughly annealed to insure ruggedness and perfect alignment. Slab steel bumpers are provided at front and rear, and boiler is well secured to frames, allowing freedom for expansion and contraction. The cab is constructed of sheet steel, with clear wire glass windows at rear, and side windows with steel cash, vertically telescoped. Total weight of the locomotive, in working order, is 118,000 pounds.

**The improved Century totally-enclosed fan-cooled motors provide necessary protection where the air is foggy with metal-cutting solutions or where there are abnormal quantities of abrasive and other dusts in the atmosphere that would ordinarily injure or clog the windings of a general purpose open motor. A generous quantity of cooling air is forced through the large air passages by the non-sparking fan, causing a cooler motor with cleaner air passages.**


# TRI-VIBE ★ for ★ DEFENSE

**against the high cost of *Fine Mesh* Screening**

. . . because, size for size, the LEAHY Type C No-Blind Vibrating Screen, equipped with TRI-VIBE, gives greater capacity . . . and conversely, you can produce a given tonnage of uniform fine-mesh material with a shorter, less costly LEAHY Screen. Write for Bulletin No. 14 H.

**The Deister Concentrator Company**
The Original Deister Co.
Est. 1906
911 Glasgow Ave., Fort Wayne, Ind.

## • Drill

The Keystone Driller Company of Beaver Falls, Pennsylvania, adheres to a combination of welding and riveting in the structural framing of its new crawler-mounted Model 51 blast-hole drill.

The problem of perpetual shock, which must be dealt with in the design of a blast-hole borer, is met in this unit by the use of large, short span shafting and anti-friction bearings of ball or roller types; by transmitting power to the drilling crank through a heavy, shock-neutralizing, multi-cord belt and by a perfected system of masthead shock absorption, the principal features of which are a dual-spring cushion under the crown pulley, of such capacity as to preclude breakage or deterioration in service, and a hydraulic recoil cylinder, the whole device being covered by Keystone patents.

Crawler-mounted blast-hole drill.

The machine incorporates the long accepted Keystone system of spudding motion and stroke adjustment, a power derrick-raising device and pantograph tool-guide. It is mounted on full crawlers which are independently driven and reversed for convenient steering. It has sufficient stability to be moved over ordinary terrain with derrick erected. The full height of the derrick is 38 feet; and it may be telescoped for operation at a height of 24 ft. 4½ inches.

The drill weighs 18,200 pounds; ground pressure is 7 pounds to the square inch.

## • Semi-Trailer

A new development in hauling equipment in the form of an all-steel arc-welded hopper-type semi-trailer was announced recently by the Landis Steel Construction Company of


**SCHRAMM** *the perfect combination*
**for FAST ROAD BUILDING**

Removing 1000 to 1200 cu. yds., of hard seamy rock per day with 2 Schramm Diesel Engine Driven Portable Air Compressors and 2 Cleveland Wagon Drills. Cut 70 ft. deep. 140,000 cu. yds. being removed.

**SCHRAMM COMPRESSORS** *are the* **CHOICE** *of* **CONTRACTORS**

★ **START EASILY AND QUICKLY.** Built-in Electric Starting on all models from 20 to 420 cu. ft. sizes, both Gasoline and Diesel Engine driven.

★ **EASY TO MOVE.** Light weight and compact design using modern engines and compressors make moving easy and inexpensive.

★ **EASY TO SERVICE.** All adjustments are accessible.

★ **MANY YEARS SERVICE.** Pressure lubrication to all bearings reduces wear and tear.

★ **COST NO MORE TO BUY.**

**SCHRAMM, INC.** WEST CHESTER, PA.
DEALERS IN PRINCIPAL CITIES

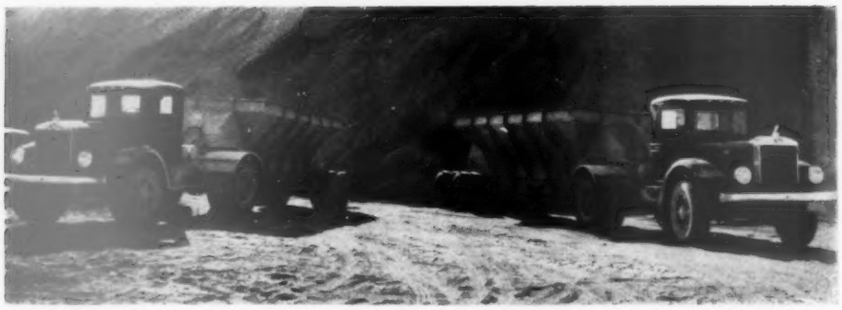
**STOP**
**THE EPIDEMIC of BURN-OUTS**
**WITH... PYRASTEEL Kiln Ends**

**Kiln Ends have a way of burning out most unexpectedly. Such accidents are not only frequent and widespread but costly.**
**Operators suffer heavy losses from shutdowns, repairs and crippled production . . . *except* in mills that have installed PYRASTEEL Kiln Ends.**
**These last for years, instead of months or weeks. They pay dividends in extra economies by saving fuel, reducing maintenance, and insuring uninterrupted kiln output.**

Segments easy to assemble or replace.

**Write for Bulletin on this Heat-Resisting Alloy**

CHICAGO STEEL FOUNDRY COMPANY
PYRASTEEL for high temperatures
KEDZIE AVE & 37th ST CHICAGO Makers of Alloy Steel for 30 Years
EVANSTEEL for strength



Two of the all-welded trailers.

Picher, Oklahoma. This unit, two of which can be seen in operation in the above view, was developed primarily for efficient loading, transporting and dumping of gravel. Of arc-welded construction, these trailers have hoppers fabricated of 8-gage Mayari-R steel and all welding was done with shielded arc equipment supplied by the Lincoln Electric Company of Cleveland.

Welded construction in heavy excavating and earth-moving equipment is now standard with many manufacturers. This method is said to provide increased carrying capacity through maximum strength for least weight and of particular advantage, according to users, is the absence of projections on inner surfaces. This eliminates clogging and assures clean dumping of gravity-unloading equipment.

The new Landis trailer hauls 30 tons of gravel and the door openings in the hoppers are controlled directly from the cab of the truck. The two hopper doors may be operated simultaneously or individually.

## • Dust Filter

The W. W. Sly Manufacturing Co. announces an improved model of its Economy dust filter—a simple, inexpensive unit used as an auxuliary to larger filters, or with individual machines requiring exhausting, such as grinders. Mounted on a platform with rubber-tired casters, the filter is readily portable, and is easily moved. Very little space is required as the exhaust fan is mounted on the filter. The unit is also supplied unmounted, and can be placed on the floor, against a wall, or suspended overhead.

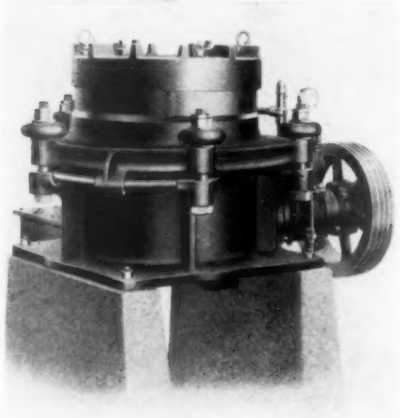
Handling 1000 cubic feet of air per minute, the filter is shipped completely assembled, including a 3 horsepower motor. The filter contains special cloth bags which thoroughly clean the dust-laden air. The bags are shaken by means of shaker handle on right side of exterior to remove any clinging dust.

### Rizor Replaces Steward

The Marion Steam Shovel Company announces the appointment of D. E. Rizor as manager of the Chicago district to replace John L. Steward, resigned.

### Moves to Newport

The Federal Alloy Block Company has moved across the river from Cincinnati to Newport, Kentucky.



**Due to the demand for the 18-inch Telsmith Intercone crusher during the past several years, it was recently decided to increase this line of reduction crushers by adding a larger size. Smith Engineering Works, Milwaukee, now has a 28-inch Intercone crusher to offer the producer whose demands call for larger volume capacity but still keeping his initial investment in the lower price brackets.**


SAVE NOW
ON POWER COSTS

Yours FOR THE ASKING

Here's an engine that attacks your power costs from these four angles:

- CONVERTIBLE . . . lets you use the lowest-cost fuel available in your location, whether it be Diesel fuel oil or natural gas. No horsepower loss in conversion.
- ECONOMICAL . . . burns fuel so efficiently that no other type of prime mover can match it for economical power production.
- DEPENDABLE . . . built with extra-rugged Diesel sturdiness in every piece and part, to last many long years, without failure.
- SELF-SUPPORTING . . . pays for itself as it goes, and soon begins earning profits above and beyond its costs.

BUILT IN 5, 6, 7, and 8 CYLINDERS
RATING FROM 300 TO 900 HP
If your power needs are between 300 and 900 hp, fill in the coupon and we'll send you the JS bulletin *without obligation.*

COOPER-BESSEMER
Type JS ENGINES
*Convertible Gas or Diesel*

THE COOPER-BESSEMER CORPORATION, Mt. Vernon, O
Please send me a copy of your 12 page Type-JS Bulletin.
Name ..... Title .....
Company .....
Street .....
City ..... State .....

## • Compressor

Clark Brothers Company, Inc. of Olean, New York, announces a new horizontal compressor for air or gas which will handle pressures up to 15,000 pounds per square inch. The new unit is small, compact and adaptable to any type of drive. The company also offers high-pressure compressors in other sizes.

# Trade Literature

*Sharp Bits Make More Hole,* (Bulletin 111). 4 pages. Alloy Steel & Metals Company, Los Angeles.

*Where and Why to Pump Your Concrete with Pumpcrete,* (Bulletin 382). 24 pages. Chain Belt Company, Milwaukee.

*Robins Oro Manganese Steel Apron Feeder,* (Bulletin 112). 4 pages. Robins Conveying Belt Company, Passaic, New Jersey.

*New Push-Button Stations,* (Bulletin 3469). 4 pages. *Manual Motor Starting Switch,* (Bulletin 223C). 4 pages. General Electric Company, Schenectady, New York.

*Akins Classifiers,* (Bulletin 24HA). 32 pages. Colorado Iron Works, Denver.

*Low Cost Material Handling with B-G Conveyors.* 4 pages. Barber-Greene Company, Aurora, Illinois.

*LeTourneau Earth-Moving Equipment — 1941.* 24 pages. R. G. LeTourneau, Inc., Peoria, Illinois.

*Hendrick Screens for Sizing and Dewatering.* 8 pages. Hendrick Manufacturing Company, Carbondale, Pennsylvania.

*Century Totally Enclosed Fan Cooled Squirrel Cage Induction Motors.* 4 pages. Century Electric Company, St. Louis.

*Hercules Power Units.* 76 pages. Hercules Motors Corporation, Canton, Ohio.

*Rotor-Lift Portable Crushing and Screening Plants,* (Bulletin D-41-G). 12 pages. Diamond Iron Works, Inc., Minneapolis.

*The Johns Conveyor . . . the Pipe Line that Moves.* 8 pages. Osborn Manufacturing Company, Cleveland.

*Now You Can Make Your Own Brick with the Little Dave Brickmaker.* 4 pages. R. F. Reed Company, Three Rivers, Michigan.

## Book Reviews

SABOTAGE AND HOW TO GUARD AGAINST IT, *by Harry Desmond Farren. Published by the National Foremen's Institute, Inc., New York. 60 pages. Price $1.00.*

With "all aid to Britain" striding toward what jingoists feel is physical participation, and what others hope will remain as "material" aid, the saboteur looms a sinister figure against the background of our industrial and social lives.

In a tempo that never lets down, the author portrays the operations of saboteurs during World War I. He highlights the sabotage cases during World War II. Meticulously the book reveals the machinations of the Nazi sabotage network, as directed by the Auslands organization. You begin to see what happened to France: why Winston Churchill rounded up all suspected subverters. The author states in fact that we are at war with Hitler, by supplying Britain's needs. He predicts Axis saboteurs have already received "total war" orders against American industries.

The book comes off the presses at a time when the President, cognizant of the threat, has taken steps to thwart it through legislation; when the Dies Committee "white papers" say that 300,000 suspected subverters are at large; when 1,500 men have been added to J. Edgar Hoover's F.B.I.

The book is not alarmist literature. Although intended for industrial workers, it will be, and should be, read by all Americans who have their country's good at heart.

* * *

WAGE DETERMINATION, by John W. Riegel. Published by The University of Michigan Press, Ann Arbor. 138 pages. Price $1.00.

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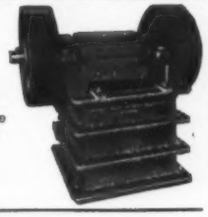

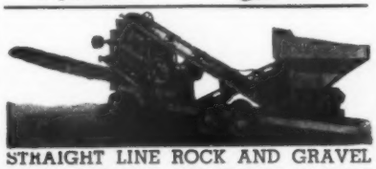

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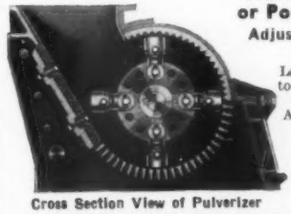

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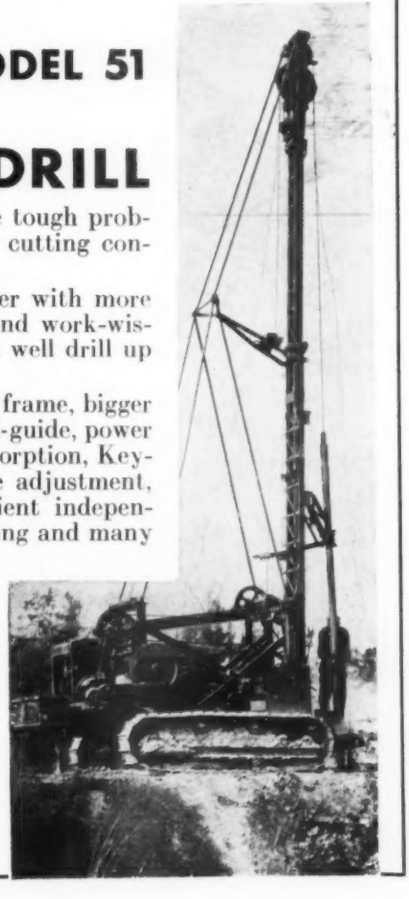

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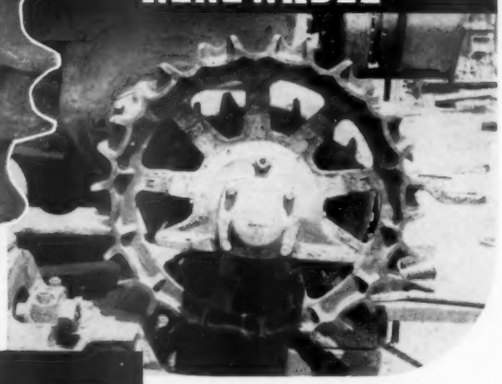

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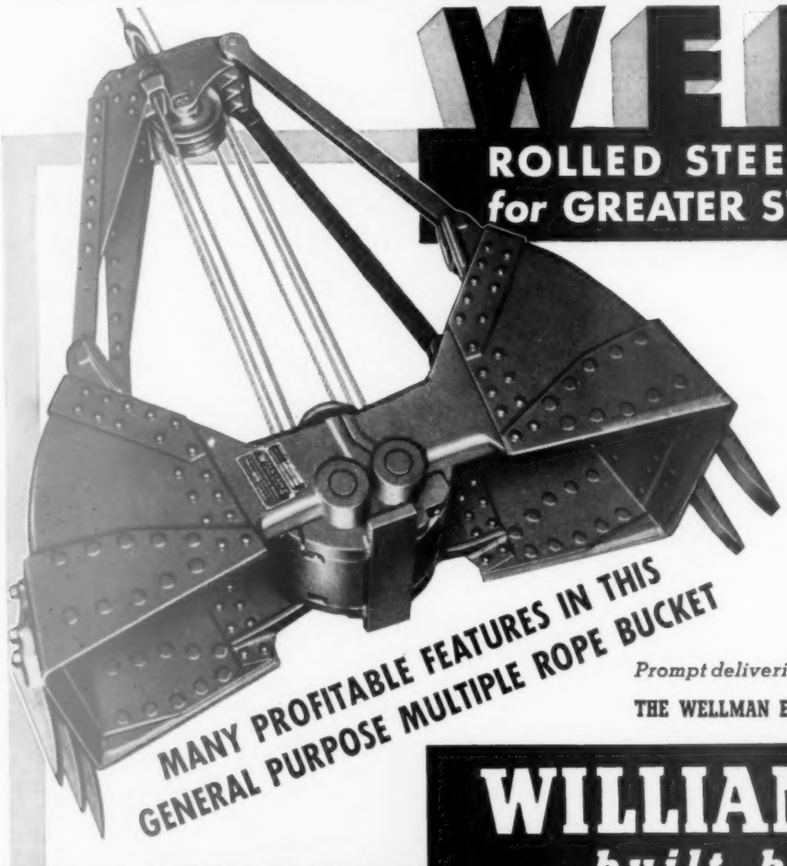

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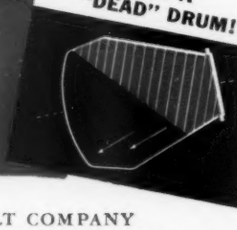

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# The CONCRETE MANUFACTURER

March, 1941

A SPECIAL SECTION OF PIT AND QUARRY DEVOTED TO PRODUCTION MARKETING AND USES OF CONCRETE PRODUCTS AND READY-MIXED CONCRETE

**Published by Pit and Quarry Publications**
**538 South Clark St. Chicago**

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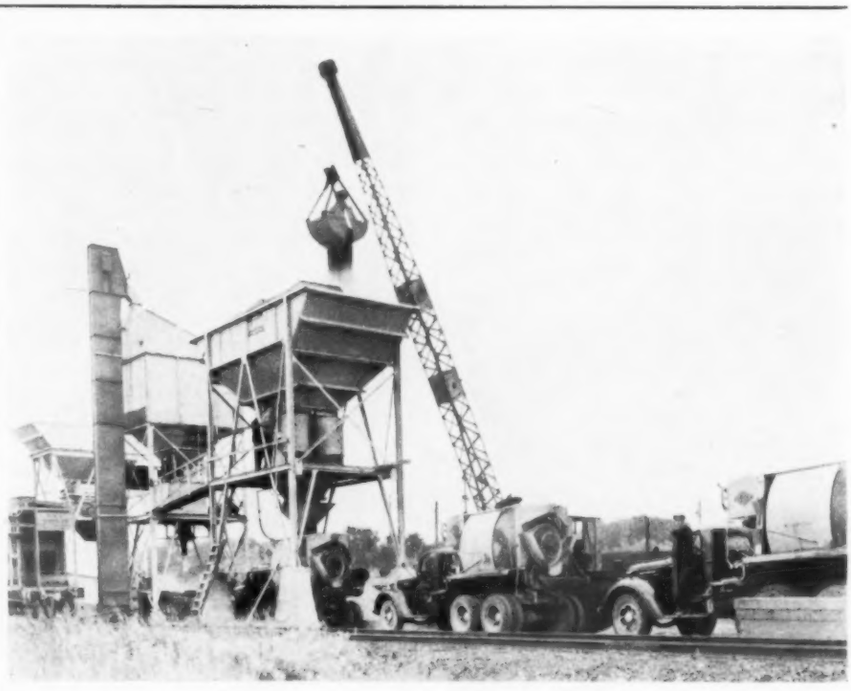


DUNKIRK, NEW YORK, has been the scene of considerable construction activity as the result of the New York Central Railroad's program to eliminate grade crossings on its main line in this area. The concrete materials for this project are produced at this batching plant, built by Blaw-Knox Company for the Concrete Delivery Co., Inc., of Buffalo. The batching plant feeds a fleet of 12 Blaw-Knox 3½-cubic yard Trukmixers.

The aggregate bin in the foreground is of three-compartment type, 110-ton capacity, equipped with a special 3½-cubic-yard beam scale weighing-and-volume batcher. The reason for the volumetric facility is the use of blast-furnace slag as one of the aggregates. This material varies in weight considerably and a radical change of weight will become evident through the volumetric check on each batch. The cement bin is of 300-barrel size, two-compartment type, with a 3½-cubic-yard New York State type electrically-interlocked cement-weighing batcher. The bin in the background is a Blaw-Knox two-compartment, 51-ton aggregate unit, used for split batches.

In order to keep in close touch with its rapidly widening circle of customers, Stearns Manufacturing Company, Adrian, Michigan, has made a characteristically progressive move in the purchase of a private passenger plane for the use of its officers. Parked in the company's own hangar at Adrian Airport, the plane is available for urgent business trips and will be used by all members of the company's management—Eugene F. Olsen, president and general manager; C. S. DeLamater, secretary and sales manager; and Arthur B. Mays, vice-president and chief engineer. The plane is a two-passenger Aeronca "Superchief," with a cruising range of 600 miles. Mr. Olsen appears alongside the ship in the above view.

The CONCRETE MANUFACTURER

# New Ideas, New Processes Discussed as Products Makers Meet in Chicago

CHICAGO was the capital of the concrete industries for three days last month when concrete products makers, concrete contractors and allied groups gathered for their annual conventions at the Hotel Sherman. The exhibit of equipment at the Concrete Industries Exposition, on display afternoons and evenings during the conventions on February 10, 11 and 12, was one of the largest in recent years and reminiscent of the old "cement shows" of a quarter century ago. Attendance was excellent, interest in the meetings at high pitch as evidenced by the spirited discussions which developed, and equipment makers packed up their wares after the event closed with

Left to right: Irving Reid and Joseph Chadwick, Markle Cement & Coal Company, Muskegon, Michigan; J. F. Robbins, Koehring Company, Milwaukee.

batches of orders for machinery tucked away in their portfolios.

Of paramount interest as gaged by attendance at meetings were the convention sessions of the National Concrete Masonry association. These were held on the mornings of the three days to enable those present to spend the afternoons wandering through the exhibits, examining the new and improved machines and meeting old friends.

The first N. C. M. A. session on Monday was attended by about 350. Roy McCandless, association president, was in the chair and introduced the first speaker, H. B. Davidson of *Better Homes & Gardens* magazine. Mr. Davidson urged that the products men ride the rising tide of residential building which has arrived. He exhibited charts of home-building cycles which for more than a century have shown definite ups and downs regularly for 8- or 9-year periods. The low point of the last cycle was reached in 1933 and 1934. Since then the trend has been gradually upward and the speaker predicted that we are now in the second year of a boom cycle which he expects will reach its peak in 1943.

He stated that a big opportunity still exists in the residential remodeling field which knows no season and urged that the products makers go after this type of work to round out their activities.

The speaker described the Bild-Cost plan service, a regular feature of his magazine, in which a house is described and illustrated each month. This service provides the reader with complete plans and a list of materials which enables the prospective builder to go to his local dealer to determine exactly what the house will cost to build in his own community.

Progress in concrete-house construction in the Kansas City area was related by Sanford Coats, Portland Cement Association engineer. He told of a survey in which it was found that 84 per cent. of the houses being built were sponsored by operative builders and of the decision to concentrate promotion in this field. The average small concrete house there has required from $300 to $600 worth of concrete units, he said. The erection of demonstration houses and the use of exhibits at home-owners' shows has done a lot to stimulate activity.

"The way to improve our business is to develop new business . . . not wrangle among ourselves for the existing business," said Assistant Secretary E. W. Dienhart, the next speaker. He pointed out that the present scarcity and high price of lumber because of temporary housing demands of the defense program affords an ideal time to develop this new business. As an example of what can be done in the building of concrete houses, Mr. Dienhart cited the experience of one Philadelphia operator who made and sold the equivalent of 1,200,000 standard concrete masonry units in 1940, all of them going into new concrete dwellings.

Frank Barber, a Knoxville, Tennessee, architect who is well-known for his buildings employing concrete units and

H. H. Wise, Stone Machinery Company, Syracuse, and a group of interested producers watching concrete-sawing demonstration.

precast concrete floors, proved to be an entertaining speaker. Although he is now thoroughly sold on cinder-concrete units as an ideal building material he described his early resistance to the material when, to quote Mr. Barber, "he looked upon it as a product of the ash pit mixed with cement." After observing the material in service in some of the larger cities, particularly Detroit, he soon became thoroughly sold on its practicability as a structural material and its usefulness in architectural expression. Many theatres, schools and fine residences have been built in the South under Mr. Barber's supervision that are largely of concrete.

W. G. Kaiser, head of the Portland Cement Association's cement-products bureau spoke briefly on the opportunities for using concrete masonry in the defense program. Mr. Kaiser appeared on the program in place of David Wright, the association's housing consultant, who had been called to Washington. Considerable progress has al-

### *Make These Your Aims*

**W. G. Kaiser, manager of the Portland Cement Association's Products Bureau suggests this platform for every concrete products maker in 1941:**

- **Go after the big orders . . . but don't neglect the little jobs.**
- **Despite the customer's urgency, deliver nothing but top-quality, fully-cured units.**
- **Try to do a better merchandising job.**
- **Analyze your production methods . . . you may be able to increase operating efficiency.**
- **Lend your whole-hearted support to the National Concrete Masonry Association . . . it is doing a splendid job for the entire industry.**

Left to right: E. P. Maynard, Pre-Cast Step Form Company, St. Paul; L. W. Reimers, Grays Lake Sand & Gravel Company, Grays Lake, Illinois; P. Hess, Hess Cement Company, Chicago; A. Weiss, Weiss Construction Company, Chicago; Sam Hess, Hess-Weiss, Chicago; P. A. Maynard, Pre-Cast Step Form Company; Frank Kogl, inventor of the precast concrete step.

ready been made in this direction and Mr. Kaiser urged that the products manufacturer work closely with his local construction quartermaster to obtain approval on concrete masonry when other materials are specified, that he keep in close touch with approved contractors and see that cost estimates for concrete masonry are submitted, and that he insist that specifications for construction as written by the

Barney Devine and G. K. Viall of the Chain Belt Company, Milwaukee.

architects and engineers include concrete masonry and concrete floors whenever this is practical.

The session closed with a short address by President McCandless.

On Tuesday, the products men met jointly with the concrete contractors and exhibitors. The Grand Ballroom was filled for this session, more than 700 having been present. A motion picture showing the much publicized Pennsylvania Turnpike in its construction and completed stages was first shown. Chairmen at this session were Harve E. Kilmer, representing the products makers, and Bert Carey of the contractors' group. The general theme of the session was the concrete residence floor, heralded as the greatest undeveloped market for concrete.

A dozen men who are accomplishing results in this promising field spoke at this session. First to appear was L. M. Upchurch who conducts the Hoke Concrete Works at Raeford, North Carolina. He described the manufacture and use of the I-beam concrete joists and the 24- by 24-inch Stonex floor slabs he is producing. The slabs, 2 inches thick and weighing 80 pounds, are handled with large suction cups on the job. Another producer of this type of material, W. M. Ketchin

R. E. Conway, Standard Equipment & Supply Corporation, Hammond, Indiana, and Lion Gardiner, Jaeger Machine Company, Columbus, Ohio.

of Fort Lauderdale, Florida, and his son William, also appeared on the program. The Ketchins also use the material for mantels, stairs and in store fronts. Prices currently being obtained for the slabs, laid up, range from 50 cents for plain grey units to 60 cents

Left to right: H. E. Dunn, W. E. Dunn Manufacturing Company, Holland, Michigan; J. H. Matter, J. J. Matter Company, Stafford Springs, Connecticut; Roy T. Hoke, R. T. Hoke Lumber Company, Stillwater, Minnesota; W. E. Dunn, W. E. Dunn Manufacturing Company; R. E. Weaver, Lincoln Concrete Products Company, Lincoln, Illinois; Ted Dunham, Anderson & Dunham Company, Baton Rouge, Louisiana; W. E. Spatz, Lincoln Concrete Products Company; J. A. Krause, Riverside Dunbrik Company, Thiensville, Wisconsin.

for colored slabs. Where distant deliveries are necessary, as in Palm Beach or Miami Beach, the price is somewhat higher. For a complete illustrated description of the Ketchin operations the reader is referred to PIT AND QUARRY, November, 1940, pages 75-76.

C. A. Bullen of Chicago told of the success his company is having in manufacturing and marketing Flexicore floor and roof slabs. These units, which are rectangular in cross section and each containing two cylindrical core holes, are made in varying lengths and provide strength, fire safety and finished floor and ceiling surfaces at relatively low cost. Mr. Bullen said that complete installations are being made in the Chicago area for about 45 cents per square foot.

Precast I-beam joists made to Portland Cement Association specifications and combined with the poured type of concrete floor is the method being used by John Strandberg of Kansas City. Mr. Strandberg told of the many installations he has made in residential

Left to right: J. R. George, Kramer Corporation, Peoria; George Erickson, Crown Sidewalk & Block Company, Minneapolis; W. L. Orr, Fairbank Block & Supply Company, Toronto, Canada; J. W. Brown, Canada Block & Tile Company, Toronto.

Left to right: P. L. Plato, Lorain Crystal Ice Company, Lorain, Ohio; G. L. Friel, Anchor Concrete Machinery Company, Columbus, Ohio; J. E. Montgomery, Pit and Quarry Publications, Chicago; F. W. Reinhold, Anchor Concrete Products, Inc., Buffalo.

construction and said that, despite the slight delay encountered in erection time as compared with the completely precast methods of floor construction, there is much to recommend this system. It is also the most economical, in his opinion.

Education of the architect, the engineer and the builder to the advantages and relative economy of concrete residence floors is the first job of the manufacturer, declared Herbert F. Loucks of the Madison Silo Company, Madison, Wisconsin. Unless this is done thoroughly and completely little progress can be expected and the maker will find his yard full of product—with wooden joists and flooring going into residences under construction, the speaker intimated. Both I-beam joists and Postonway patented units using Waylite aggregates are made at the Madison Silo Company's plant.

The use of Haydite concrete floor-filler units with reinforced-concrete rib floors was described by Walter Manhardt of Milwaukee who has promoted and sold thousands of units for this service, supplanting the clay-tile product.. He urged the undertaking of a national publicity campaign to better acquaint the building industry with this type of floor since he feels that these units, because of their similarity to standard masonry units, offer the best opportunity for the average concrete-block maker to get his share of the floor business without extensive capital outlay.

"Don't make precast floor units as a sideline of the block business and expect success," was the advice of Fred Reinhold of Buffalo. Unless the manufacturer cultivates his market intensively and sells the floor product through a well-conducted campaign he is doomed to failure before he gets well started, the speaker said. He also described and illustrated some of the loading tests on I-beam joists made by his company in the presence of architects and builders.

J. W. Warren, Knoxville products manufacturer, had a series of pictures

T. H. Fleming, Concrete Transport Mixer Company, St. Louis, and W. W. Fischer, Fischer Lime & Cement Company, Memphis, Tennessee.

Left to right: Gene Olsen, Stearns Manufacturing Company, Adrian, Michigan; Eugene Elfgen, Alton, Illinois; B. A. Crandall, Benton Harbor, Michigan; C. S. Delamater, Stearns Manufacturing Company.

thrown on the screen illustrating the residence built for his son which has been widely publicized. This modern house of functional design is most attractive and floors, partitions, walls and roof are of concrete. More than 700 persons attended an "open house" shortly after is was erected and several concrete houses were built as a result.

Harold B. Hemb, Chicago contractor, gave an analysis of the cost of concrete versus wooden floors. On a typical job, figuring 2- by 10-inch lumber for wood-joists and 8-inch I-beam concrete joists, the totals, including labor, were about 31 cents for wood compared with 40 cents for concrete. But taking finishing methods into consideration and the saving with concrete in kitchen and bathroom where linoleum and tile are ordinarly employed for covering, plus the building-code requirement that wooden ceilings in boiler- or furnace-rooms be plastered, Mr. Hemb said the final figures show little difference in cost. In any event, he said, the added cost for concrete floors in the average dwelling should never exceed wood by more than $90.

Left to right: Solomon Steiner, Concrete Block Company, Irvington, New Jersey; W. L. Orr, Fairbank Block & Supply Company, Toronto; Walter S. Giddings and A. B. Babbitt, Kent Machine Company, Cuyahoga Falls, Ohio.

Ralph Condo of Somerville, New Jersey, described and illustrated the Leesch system of precast floors and roofs being sponsored by his company, James Condo & Son. These reinforced-concrete units are in cross-section similar to an I-beam joist with a 16-inch wide flat slab at the top, giving the section a modified T-shape. When installed in the "T" position, the top flange becomes a solid concrete floor. When erected in an inverted "T" position, the top flange forms a continuous ceiling.

Other speakers on the program who discussed the advantages of concrete floors included Donald C. Wood of Syracuse and C. M. Akers of Nashville. The highlights of the presentations were summarized in a concluding talk by Mr. Kaiser, who outlined also the broad promotional program being conducted by the Portland Cement Association.

The final session, on Wednesday, was in the nature of a clinic for the discussion of new ideas, methods and processes. Before opening the session proper, however, those attending were treated to a spectacular motion picture showing the recent collapse of the suspension bridge at Tacoma, Washington.

Wall cracking has long been a bugaboo in concrete masonry, just as it has been in all types of masonry construction. Harold L. Spaight of the Cedar Rapids Block Company, Cedar Rapids, Iowa, described the development of the Duro-Wall reinforcing system which his company has used with considerable success. This consists of two round parallel bars of light, high-tensile steel held rigid by short, diagonal cross members welded into position. This flat, ladder-like reinforcing is laid in with the mortar every third course or oftener to prevent cracking. The side rods are imbedded about 1 inch in from the mortar faces, the reinforcing being made up 6 inches wide for 8-inch block courses, 10 inches wide for 12-inch blocks, etc.

A method of providing faced concrete units with scored joints to give the laid up wall a random-ashlar effect was described by Eugene Liepold, whose company, the Advance Cast Stone Company of Milwaukee perfected the process. Ribs on the pallets impart the score marks as the units are molded on the face-down machine. The units are faced in two tones of subdued color. This, according to Mr. Liepold, improves their laid-up appearance by tending to keep the individual block mortar outlines from standing out too prominently.

Is high-pressure steam-curing practical for an average-sized plant? That, according to Luther Randolph of Ann Arbor, Michigan, depends upon various factors. In his own plant, which has the distinction of being the first to be designed exclusively for the curing of concrete units by this rapid method, the method chosen because storage space was limited. Rather than move to another location, acquire a large site and rebuild his entire plant, Mr. Randolph chose the high-pressure-steam method whereby his output can be molded, cured and delivered to the job in hours instead of days. *(P&Q, September, 1940, pages 75-76).*

The investment in curing cylinders at the Randolph plant was held to a minimum through the acquisition of used equipment. It costs about one-fifth of a cent more per block to cure by the high-pressure-steam system, Mr. Randolph stated.

An illuminating discussion on effecting variety in the appearance of

Elias Fellabaum, Peerless Cement Products Company, Charleston, West Virginia and Frank Muenzer, Multiplex Concrete Machinery Company, Elmore, Ohio.

concrete-masonry walls by the use of different types of joints was led by Herbert J. Vincent of Cinder Block, Inc., Detroit. Five joints were described (1) the square-tooled, (2) the V-tooled, (3) the round-tooled, (4) the raked joint, and (5) the flush joint. The speaker exhibited the tools being used for the purpose and showed some colored slides which depicted some of the beautiful effects being obtained. He cautioned, however, against raking the joints too deeply since the thin-walled block being used nowadays needs as much mortar as possible if moisture is to be kept out. Except where bizarre effects are sought, the joint should be kept within ½ to ⅜-inch limits, he believes.

Although the 3-hole block is now almost universally used, Austin Crabbs, Davenport, Iowa, operator continues to make the 2-hole variety. He spoke briefly on why he continues to manufacture it, his chief reason being that his experiments have indicated that it does away with wall cracking to a large extent.

George W. MacNeill of the Chicago Dunbrik Manufacturing Company spoke on the marketing of concrete brick. His selling methods, he said, simply involve making plenty of calls and leaving plenty of samples with his prospects. An enlightening article by Mr. MacNeill on this very subject was published in the August, 1940 issue of PIT AND QUARRY.

*The Value of a Laboratory for a Concrete Products Plant* was the subject of a discussion by A. L. Bowling, engineer, Cinder Block Inc. of Roanoke, Roanoke, Virginia. The procedure he recommends is first to test the quality of the raw cinders, then to determine and execute the proportions for a mixture. He also stressed the necessity for testing the finished product and for constantly striving to improve it. In the manufacture of cinder products, he said, the testing of raw materials is more of a necessity than when other aggregates are used because of the lack of uniformity. The only safe method is to test each carload of cinders as it is received and to design the mixes accordingly.

Mr. Bowling described his program of daily tests for dry-rodded weight, sieve analysis, etc. As the products are pressure-steam-cured autoclave tests are also made. As a final quality check physical tests are made on 5 blocks of each type made in any one day. These tests include those for compressive strength, absorption, etc. He said that experience has proved that tests of the raw cinders save block loss and tests of the finished blocks save the freight costs which go with rejected shipments. A laboratory, he said, is expensive to operate but pays for itself. A producer of average size, said Mr. Bowling, can operate his own laboratory cheaper than he can hire the work done by an outside laboratory.

In response to questions Mr. Bowling described his method of sampling the cinders in a car with a scoop. About 15 pounds of cinders is scooped off from all parts of the car and the sample is taken out of this. The usability of the cinders is first determined by its combustible content. Over 40 per cent. is considered unsuitable, and any cinders even approaching this figure are blended with better cinders. The weight of the cinders is another guide to quality.

*A Discussion of Standard Specifications with Recommendations for their Revision* was the subject covered by P. M. Woodworth, Portland Cement Association, Chicago. He first reviewed briefly the history of concrete-products specifications and described the first specification which required 800-pound strength and a maximum absorption of 15 per cent. He told how specifications adopted in 1924 provided for both 700- and 1,200-pound blocks and how the higher strength was dropped in 1929. The first A. S. T. M. specification, according to Mr. Woodworth, was adopted in 1931. This specification, he said, covered sampling and testing, and gave separate requirements for hollow load-bearing, hollow non-load-bearing and solid load-bearing blocks, concrete bricks and manhole blocks.

Mr. Woodworth said that there is a scarcity of information on the reaction of blocks exposed to severe weather conditions. The University of Wisconsin tests, he said, gave the first definite conclusions on this important subject. Such blocks, he said, call for a minimum compressive strength of 1,000 p.s.i. of gross area. He mentioned the 34 regional meetings of producers which have been held to get a cross-section of opinion on the advisability of classifying blocks according to the conditions to which they will be exposed. The three proposed classifications are protected, exposed, and severe exposure, and they do not affect other requirements. Discussion brought out the fact that a 1¼-inch minimum shell thickness is required. The strength requirement for individual units is 900 pounds with a 1,000-pound average.

It was agreed by those present that Mr. Kilmer should submit this proposed specification to members for a letter ballot.

J. P. Jarvis, Portland Cement Association, Chicago, spoke on *Scored Concrete Units Show the Way to Economy in Constructing Concrete Ashlar Masonry Walls.* The scoring of concrete blocks, according to Mr. Jarvis, makes possible the beauty and architectural adaptability of random ashlar with the economy of standard 8- by 8- by 16-inch blocks. This new product, he said, can be made either by casting the block with grooves or by cutting them with a masonry saw after they are partly cured. The latter method was recommended for several reasons, including its flexibility in turning out any desired patterns. Slides were shown to illustrate the various combinations of horizontal and vertical cuts which can be made. Mr. Jarvis warned against the use of freak designs and also said that vertical cuts should be made at the web rather than the core. Horizontal cuts are best made off-center.

Mr. Woodworth commented that the underwriters will probably accept this product, especially if the grooves are filled in with mortar.

R. E. Copeland of the development department of the Portland Cement Association then described *A Practical Method for Drying Concrete Units Through the Use of Heated Forced Air.* These tests were made at the plant of the Mid-West Concrete Pipe Company at Franklin Park, Illinois. In introducing this subject Mr. Copeland pointed out that walls built of dry units shrink much less than those made with wet units. He predicted that the specification limiting the moisture content of the block to 40 per cent. of the total absorption will be more widely adopted and may in time become as important as the compressive-strength specification. For this reason drying tests are of vital importance to producers.

The drying tests were made under varied conditions but on an actual operating scale. A portable heating unit with a blower was used to blow heated air through blocks piled in various ways. Some blocks were piled in the usual manner with cores vertical and resting on the ground. In others pier blocks were used to allow the introduction of air at ground level.

A graph showing the results of these various arrangements under natural or artificial drying methods or a combination of the two showed that block piled in the usual manner on the ground would take several months to reach the 40-per cent. moisture limit. If covered with tarpaulins a much-shorter period was required. The combination method brought blocks mounted on pier blocks down to 27 per cent. during the test period. According to Mr. Copeland, even more rapid results were obtained with partition tiles which in 21 days dropped to a 20-per cent. moisture content.

John Chase, head of Chase Building Products, Inc., of Fort Worth, Texas, was elected president of the association for the ensuing twelve months. He succeeds Roy McCandless who, according to custom, assumes the post of chairman of the board.

# Sand Lime Brick Association Holds Interesting Meeting

FOR the first time in its history the Sand Lime Brick Association held its convention at the same time and place as the Concrete Industries Convention—February 10 to 12 at the Sherman Hotel in Chicago. This was done because so many members of the association also make concrete products. Sessions were arranged so that those interested in any branch of the concrete-products industry might attend these meetings, too, as well as the huge Concrete Products Exposition.

At the suggestion of C. A. Perkins, president of the association, the constitution was amended to permit the membership engaged in processing masonry material by high-pressure steam to contact others using the same process for the purpose of securing their cooperation and assistance in building a strong association for the advancement of common interests. Mr. Perkins pointed out that during the last ten years larger units than bricks, especially concrete blocks, have forged to the front. Since the sand-lime-brick industry and cement-products industry have much in common, more will be gained by coöperation than opposition. High-pressure-steam curing is almost unknown to the cement-products industry, he said. Because of the technical data acquired by the Sand Lime Brick Association over a period of years, it has much to offer the cement-products industry. Harold Levine of Long Island City, New York, was appointed chairman of the High-Pressure-Steam Curing Committee.

As a reward for outstanding service, the association reëlected C. A. Perkins of Mishawaka, Indiana, president and J. Morley Zander of Saginaw, Michigan, secretary-treasurer. To give Canada representation, Mr. Ryan of Windsor, Ontario was elected vice-president. The Executive Committee selected a year ago—C. H. Carmichael of Philadelphia, Pennsylvania, C. G. Miller of Pacific, Missouri, and Harold Levine of Long Island City, New York—was retained for the coming year. The officers also serve on this committee.

Because of the compactness of the group, there was an informality at the meetings not possible in a larger gathering. Questions were asked frequently and the convention was very much like a round table in which everyone took part. As a result, many ideas were brought forth which would never have seen the light of day at a large meeting where everything works on schedule. Mr. Zander, the secretary, selected the men best qualified to lead these discussions and at the conclusion of the convention everyone present felt that a great deal had been accomplished.

On Monday afternoon Carl Miller of Pacific, Missouri, was the first speaker. To illustrate what can be done, he brought with him several samples of the products made by his company. Everyone marveled at the whiteness of the bricks and blocks—a property which he explained was due to the fact that the sand used tested 99 per cent. silica. Like many firms, Mr. Miller explained, his company experimented with building its own machines. The results were not satisfactory at first, but after several adjustments were made, they performed just as well as those on the market. In the St. Louis market, where his company operates, competition is strong from both clay- and concrete-products manufacturers. Sand-lime brick, however, brings a premium of 2 cents over concrete blocks because of their color and shape. He urged the members to advertise more, pointing out that his company was successful in increasing sales by mailing folders to a selected list about four times a year.

Because his company has had so much experience in building rack cars, Ralph Cromiss of Pontiac, Michigan, was selected to discuss this subject. He told how his company built its own equipment successfully and passed around pictures to illustrate the cars in actual use. The cars they make are 56 inches long and cost around $65 to $70. Second-hand steel is used to keep down the cost.

Although Harold Levine had not prepared a formal paper, as usual he made a fine speech full of important information based on his long experience in the industry. He said that, in selling high-pressure-steam-cured units against air-cured units, it is necessary to approach the architects before specifications are drawn. You have to show them that shrinkage does not take place and that the steam-cured units have definite advantages. Otherwise it will not be possible to obtain a higher price. This procedure is especially necessary on state and municipal jobs. Unlike most producers, Mr. Levine's company uses anthracite rather than bituminous cinders. By doing this it does not need a crusher and popping and spoiling is kept down. Mr. Levine suggested that an organization should be formed to test high-pressure-steam-cured units against air-cured.

Dr. Lansing Wells of the Bureau of Standards at Washington has become somewhat of a fixture at sand-lime-brick conventions. It was with great interest, therefore, that the members listened to what he had to say about the work done during the past year with calcium silicates and the heat treatment of calcium silicates by high-pressure steam. Although his talk was technical, it touched on important points and many questions were asked. He urged members to try different mixtures in order to improve their products.

In concluding the session, J. Morley Zander read an interesting paper on *The Bonding Cement Used in Making Sand-Lime Brick*. He stated that sand-lime-brick making is a chemical business. Much of the "grief" has come through ignorance or carelessness in completing the chemical formula. A poor product may be accepted by customers at the time, but if it does not stand up over the years, all one's business will be lost and the building departments will set up restrictions against the use of sand-lime brick. He urged all plants making concrete products cured in high-pressure cylinders to benefit from the experiences of sand-lime-brick producers and make sure about the chemical requirements of their products.

The first producer speaker on Tuesday afternoon was A. L. Bowling of Roanoke, Virginia, one of the youngest members of the industry. He told briefly of the experiences of his company in making cinder blocks.

At the close of the Tuesday afternoon session, Elmer R. Coats of Seattle started a discussion which proved to be loaded with dynamite. He spoke of the discrimination against sand-lime bricks on government projects. It seemed as if everyone present had experiences to relate. Many of the members had overcome objections to sand-lime brick in some government departments, but had not been able to "crack the ice" in others. As a result of the discussion members found they could help each other to get business The final outcome probably will be action by the association to get changes in the federal specifications so that sand-lime bricks can be used anywhere on government projects.

In line with its policy to give manufacturers an opportunity to present the merits of their products on Tuesday afternoon two representatives selling to the industry gave short talks. One was Mr. Stone of the M. H. Detrick Company, who spoke on insulation of high-pressure-steam retorts and its value to the industry. He brought a sample of

his product and demonstrated how well it would fit the needs of sand-lime-brick and concrete-products manufacturers.

The other talk was delivered by Mr. Wegeman of the Nowak Company, distributors of ArmorCoat paint. This is a waterproof paint which has been subjected to many tests. Mr. Wegeman conducted several tests to prove the waterproof qualities of this product.

# Cast-Stone Producers Attend Special Plant Demonstrations

MEMBERS of the Cast Stone Institute met in annual convention at the Bismarck Hotel, Chicago, February 10 and 11. They listened to papers dealing with a new process of transferring ornamentation to cast stone, progress made in the use of architectural concrete, the opportunities of cast-stone manufacturers to revive ornamentation in structures, the making of concrete products by cast-stone makers, and similar subjects.

The first discussion of the opening session dealt with *The Lithichrome Process of Architectural Ornamentation*, a talk by Mr. Johnson of Theodore Johnson & Sons, Inc., Chicago Heights, Illinois. Mr. Cleveland, inventor of the process and head of the C. E. Cleveland Lithichrome Company, Salina, Kansas, was present and contributed some information in answer to questions about the method. The Lithichrome process, said Mr. Johnson, makes it possible to transfer to cast stone and to reproduce in natural colors any design, picture or decorative ornament that can be copied. Briefly, the process involves first the tracing off on a special type of carbon paper the design or picture to be reproduced. The second step is the preparation of the cast-stone surface, which should be thoroughly cleaned and then coated with a cement which is allowed to dry. On this cement is then laid a sheet of rubber, which is rolled out flat to remove wrinkles and air bubbles. When this has been completed the carbon-paper tracing is laid face up on the rubber sheet and is firmly held in place while the design is pressed against the rubber sheet by rubbing a smooth-surfaced tool along all the traced lines. This transfers the design to the rubber sheet. The tracing is then removed and with a sharp knife the worker cuts the rubber sheet along the transferred lines. The cut portions are then pulled off the stone, leaving in the exposed surface the pattern of the design or picture. The remaining rubber sheet is in effect a stencil. The exposed surface is now exposed to a sand blast, which removes the cement, smooths the surface and cuts it to whatever depth is necessary or desirable. Dry minerals of the colors required to reproduce the color scheme of the design or picture are now blown by compressed air into the sand-cut areas to be tinted, suitable "masking" being provided where necessary to protect areas already colored from being affected by the application of the succeeding colors. After the completion of the coloring step in the process the rubber sheet is removed and the entire surface can be washed.

On the afternoon of the second day those in attendance went to the Development Department Laboratory of the Portland Cement Association on the property of the Elmhurst-Chicago Stone Company, Elmhurst, Illinois, and witnessed a demonstration of the process. In an unexpectedly short time a tracing previously prepared was transferred to a slab of cast stone that was in readiness and the cutting, sand-blasting and color application were performed in the presence of the audience.

R. G. Evans, Clipper Manufacturing Company, St. Louis, and H. C. Kearney, H. D. Conkey & Company, Chicago, Illinois.

Just previous to the staging of this demonstration the preparation of cast stone with colored aggregates used as facing material was shown. Two methods were explained and demonstrated: the cement-transfer method and the aggregate-transfer method. Plywood "liners," made in convenient sizes and provided with shallow side walls bradded to their bottoms, are heavily coated with a special type of cement, which the operator called a "lacquer." Before this dries aggregate of the desired color is spread over the surface, after which the "liner" is mechanically agitated for a few seconds by horizontal circular motion on a table top to distribute the aggregate pieces more evenly over the surface of the "lacquer." The aggregate pieces are about ¼ inch in size as this has been found by experiment to give the best results. Cubical pieces can be more evenly distributed than flat and elongated particles. The "liner" is removed from the agitating table and the unattached pieces are allowed to drop off. As the "lacquer" dries quickly the "liner" is now ready for attachment to the inside of the form. To avoid dislodgment of the aggregate particles a

Left to right: Charles Jacobi, Price Brothers Company, Dayton; G. E. Evans, Crumb-Coulton Company, Rockford, Illinois; G. B. Price, Price Brothers Company; R. N. McCandless, Cinder Block Company, Detroit.

special push-type hammer has been devised to push brads through the "liner" bottom into the face of the form at frequent space intervals. After all the "liners" are in position concrete is poured into the unoccupied space and after the proper hardening time has elapsed the forms can be removed and the "liners" stripped from the aggregate. As the adhesion of the concrete to the aggregate is greater than that of the "lacquer," the "liners" can easily be pulled off without disturbing the aggregate. The "liners" can be used again and again, each fresh coating of "lacquer" dissolving the dried humps remaining from the previous use.

Obviously this process can be applied in the shop or on the job, the necessary equipment being very simple and portable. The audience was shown also how corners are made, as well as the ingenious method of treating fluted cylindrical columns or pilasters. There were examples of busts that were cast in place as parts of archways and similar structures.

Following Mr. Johnson's discussion of this method at the convention meeting, A. J. Boase, manager, Structural Bureau, Portland Cement Association, reviewed *Progress in Architectural Concrete*. He reminded his listeners that cast-stone buildings have withstood the ravages of the San Francisco earthquake and the severity of Alaska weather. One of the great problems, he said, is in getting architects to use the material. The association, in attempting to solve this problem, made available to "doubting Thomas" architects two west coast superintendents who were familiar with architectural construction and could show them how the method is used.

In 1940, according to Mr. Boase, nearly 400 buildings of cast stone were erected east of the Rocky Mountains. Precast concrete, or cast stone, he called the greatest architectural material available at the price. The man who undertakes to promote the use of cast stone must be an enthusiast, and must be blind to the "bugs" in the product. Cast stone is flexible enough, he said, to be used in all types of structures.

A strong plea for a return to ornamentation, as a relief from the dullness of flat and unadorned "modernistic" structures, was made by Herman Frauenfelder, who spoke on *A Renaissance in Architectural Ornamentation Through Cast Stone*. He complained about the absence of ornament on modern buildings because of the slick-flowing lines. There has been doubt, he said, that ornamentation can be used in modern styles, but the renaissance is coming from other directions. Architecture reflects life, and in modern life speed is one of the outstanding characteristics. However, designers are becoming tired of flat surfaces and are turning back to ornamentation. Plainness, they find, is monotonous, and through ornamentation man can show his manner of living.

Among the features of high-grade precast architectural concrete are great size, color and texture; the ornaments and color do not necessitate the use of separate pieces as in the great mosaic designs of past eras. The materials of this age are concrete, glass and plastics. He illustrated his points with color pictures showing many ways in which color and ornamentation can be obtained with cast stone.

Illustrating his thesis, *The Use of Facing Material as Forming for Structural Concrete,* with a description and photographs of the San Jacinto Memorial at Houston, Texas, Carrol Bullen, W. S. Bellows Construction Company, called this the tallest masonry structure in the world. It was built of Cordova limestone facing blocks, which were used as the outside forms for the pouring of the concrete walls within. In telling of the methods used, he said that $25,000 might have been saved in the setting cost had thinner cast-stone units been used instead of the Cordova blocks, which weighed, on the average, 7 tons each. The smaller pieces cost 25 cents per cubic foot to place, the large pieces $1.25. The huge star which tops the structure was made from steel beams and stone blocks cut and fitted on the job.

Paul M. Woodworth of the Portland Cement Association discussed *Opportunities for Cast-Stone Manufacturers in Standardized Precast Concrete Products*. He pointed out the fact that small concrete products can be made to fit into the cast-stone manufacturer's production schedule, thus flattening out the output curve, which shows sharp rises and falls throughout the year. In the 600,000 houses that will be built in 1941 there is a market for 3,000,000 lineal feet of precast sill. There will be $244,000,000 of factory construction, which can use the same type of sill, and there is a market for 1 lineal foot of sill for each $100,000 of construction. There is also a market for 1 lineal foot of coping stone for each $300.000 of factory construction, or nearly 1,000,000 feet for 1941.

Precast stairs or steps for residences would take 3,000,000 lineal feet of precast treads and risers. The market for precast joists and floor slabs has increased more than ten times in 7 years.

Mr. Woodworth pointed out that concrete molds can be used to make these products and that some molds of this type 10 years old are still in use.

As examples of the variety of products that can be precast of concrete, M. A. Arnold, the association's president, cited coal bins and slabs for use under stoves. Of the former his company has sold $15,000 worth and has orders on hand for $10,000 more.

At the first evening meeting laboratory tests of reinforcing in cast stone were reported on and there was a round-table discussion of manufacturing problems. A feature of the discussion was a review of a paper presented at the 1940 convention by R. S. Phillips on *The Fundamentals of Cement and Concrete with Especial Reference to Their Application under Plant Conditions.*

At the next morning session the Committee on Waterproofing reported with a recommendation that the provisions of the present A. C. I. waterproofing specifications be changed. It was thought advisable to reduce the water absorption from 7 to 6 per cent. and to eliminate the present 3-per cent. minimum. It was also proposed that the present strength limit of 5,000 p. s. i. be raised to 6,500. It was decided to refer the matter to the membership and the industry at large for action by letter ballot.

With reference to the permanent display of cast stone in the sample room of the Procurement Division of the United States government in Washington, it was said by Mr. Arnold that cast-stone manufacturers should make themselves ready to bid on the furnishing of cast-stone products to the government when tenders are invited. Mr. Downing had said that every architect in the government bureaus except one had reacted favorably to the display and what it showed.

A spirited talk on *Selling v. Order-Taking* was presented by Otto Buehner, who, with five brothers, operates Otto Buehner & Company in Salt Lake City. The speaker based his remarks on a large chart which occupied the wall at one end of the room. He mentioned six sources from which prospects' names are received and six types of educational material which can be used on them. He placed all prospects in five classes: (1) Not known, (2) New acquaintance, (3) Acquainted—never sold, (4) Occasional buyer, and (5) Regular customer.

For each type he discussed a special type of literature or sales approach. For the first he listed (a) Information call, (b) Learn: objections, attitude toward, information wanted. He warned, don't try to sell, and don't guess.

For the second he said: (a) Put on mailing list, (b) Answer objections, and (c) Give details of information wanted. Don't, he said, "high-pressure," and don't make rash statements.

For the third group he urged: (a)

Answer objections, (b) Analyze problems, (c) Has our product a place?, (d) Be an authority. And, he cautioned, don't dominate, and don't preach, teach.

In the case of the fourth group he advised: (a) Meet objections, (b) Introduce lines, (c) Check his objections. Don't blame this prospect for not buying, don't offer excuses, and don't be indefinite.

And for regular customers, the fifth group: (a) Meet objections, (b) Keep him sold; keep the product modern, present a new story, show developments, (c) Recognize his work, (d) Assist on his weak points. Don't be too familiar, don't assume that he knows, and don't give less attention.

As for literature he suggested for Group 1, Special literature, specific job details, an association booklet called *Cast Stone;* for Group 2, Literature file, detail material for specific jobs, quality, samples, estimates, reputable references; for Group 3, Your own literature, recognition as authority, distinctive work reference, field of material; for Group 4, Color slides, motion-picture films, photographs, service, detail literature; and for Group 5, Latest literature, new materials and uses, changes in specifications, literature of unusual detail, experimental samples.

On the subject of what to sell—the selling approach—he offered for Group 1 topics, Cast stone, quality, plasticity, color, modernness, periodic tests; for Group 2, Your organization, your plant, jobs completed, tests, details, photographs; for Group 3, One item or job, quality, finish, color, home product; for Group 4, Cast-stone line, service advertising, and the possibilities of finish, quality, and variation; for Group 5, Items not used, profitable items, new jobs.

Luke J. Boggess, who was scheduled to speak on the *Practical Application of the Proposed Quality Guarantee Plan for Cast Stone,* could not attend and the subject was not discussed.

# Concrete-Pipe Manufacturers Hold Well-Attended Meeting

THE 34th annual convention of the American Concrete Pipe Association, at the Edgewater Beach Hotel in Chicago on February 10 and 11, drew probably the largest attendance in the association's history. Almost every state in the union was represented, as was also a large percentage of the productive capacity of the industry.

Current problems occupied the attention of these producers during most of

H. D. Palmore, president of the Kentucky Concrete Pipe Company, Frankfort, Kentucky, and of the American Concrete Pipe Association, and Mrs. Palmore.

the meeting. No prepared papers were presented and little time was given to association affairs. All the officers were reëlected as follows: President, H. D. Palmore (president, Kentucky Concrete Pipe Company, Frankfort, Kentucky); vice-presidents; J. W. Porter (secretary, Gifford-Hill Pipe Company, Dallas, Texas), J. E. Miller, (president, Lewistown Pipe Company, Fort Wayne, Indiana); L. D. Bailey (president, Cretex Companies, Inc., Elk River, Minnesota); secretary and treasurer, M. W. Loving (Portland Cement Association, Chicago). The directors to serve until 1943 are: C. W. Diecks (Lock Joint Pipe Company, Ampere, New Jersey), M. C. Kelly (Great Lakes Concrete Pipe Company, Buffalo), S. H. Clark (Carolina Concrete Pipe Company, Charlotte, North Carolina). The directors to serve until 1942 are: J. D. Mollendorf (Illinois-Wisconsin Concrete Pipe & Tile Company, Chicago), C. B. Warren (Spokane Concrete Pipe Company, Spokane, Washington), B. J. Ukropina (United Concrete Pipe Corporation, Los Angeles). New directors elected to serve until 1944 are: G. D. Williamson (Valley Concrete Pipe & Products Company, Yuba City, California), W. E. Corbett (Corbett Concrete Pipe Company, Milford, Massachusetts), H. W. Easterly (Concrete Pipe & Products Company, Richmond, Virginia).

Those assembled also agreed by unanimous vote to recommend to the A. S. T. M., for adoption as standard, three new concrete-pipe specifications to supersede those now in use. The proposed specifications are: Tentative Specifications for Concrete Sewer Pipe, C14-40T; Tentative Specifications for Reinforced-Concrete Sewer Pipe, C75-40T; Tentative Specifications for Reinforced-Concrete Culvert Pipe, C76-40T. All these are available in printed form.

There was considerable discussion at this meeting of the proposed engineering hand-book which would make available to producers and users of concrete pipe detailed information about this product and its application. According to Mr. Loving, much of the material for this book is already available. After much discussion it was decided to publish this book if members ordered 5,000 copies in advance.

It was also decided that the association needed more representation in Washington and the executive committee was directed to appoint a full-time

L. D. Bailey, president of the Cretex Companies, Inc., Elk River, Minnesota, and a vice president of the association, and Mrs. R. Norman, Bismarck, North Dakota.

representative to serve for a year or more. Appreciation was also expressed for the good work done by Everett Kreitz of the Portland Cement Association's Washington office in spending part of his time there on the pipe association's affairs.

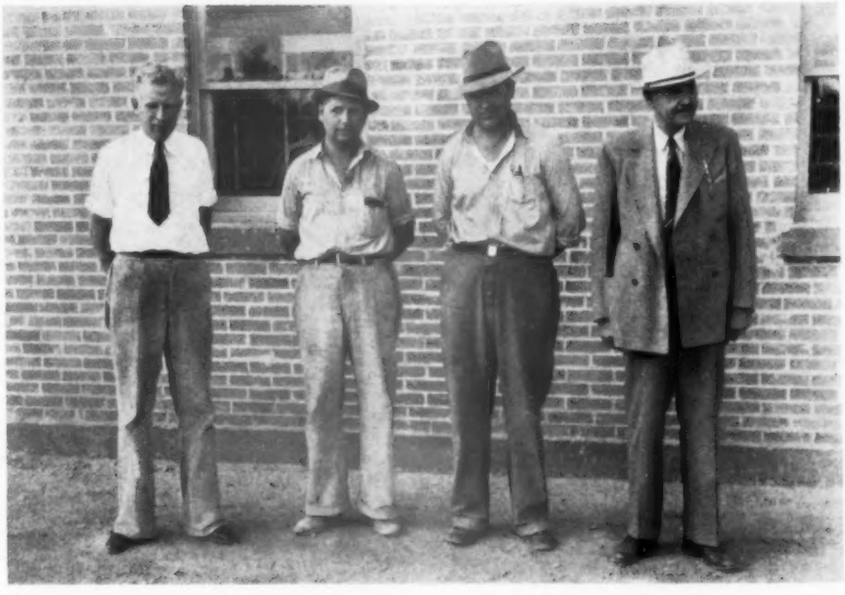
Mr. Kreitz said that a joint army-and-navy commission has given blanket approval for the early construction of 450 airports. Tests have been made, he said, comparing concrete pipe with corrugated-metal pipe and the results, which will be available soon, will determine which is to be used. Vast quantities of pipe will be used in this and other defense work, said Mr. Kreitz, and he advised producers to keep in constant touch with the local

(Continued on page 94)

W. E. Corbett, Corbett Concrete Pipe Company, Milford, Massachusetts, a new director of the association, and Mrs. Corbett.

This general view shows the concrete-brick plant at left with the plants producing feldspar and other non-metallic minerals in the background.

# Unusual Aggregates in Concrete Brick



J. W. Magnuson and three of the four sons who are in business with him. The sons are, left to right: Carl A., Arnold T., and V. E.

Finished bricks being sprayed with color while piled in the plant. At right are the color mixer and compressor.

"YOU can't keep a good man down" is an old saying which might be interpreted in several different ways.

It might, for example, be applied to a man like J. W. Magnuson who typifies the adventurous spirit which has made this country great. Working out of Denver, Mr. Magnuson has been a contractor, prospector and in recent years a producer of nonmetallic minerals. He founded and directs the destinies of the Western Feldspar Milling Company, an important producer of feldspar and various other nonmetallic minerals. These operations have grown considerably in recent years and further expansion is planned. At present Mr. Magnuson holds leases on over 65 mineral deposits in the Rocky Mountain area.

As a young man Mr. Magnuson was a concrete-building contractor and also made and sold various concrete products including plain and granite-face blocks, trim stone, etc. In Pueblo he operated the Granitoid Construction Company and in Brighton, Colorado, the Brighton Hydro-Stone Company. Although now advanced in years, Mr. Magnuson has lost none of his initiative and this spirit got him back into the concrete-products field. The fact that the market for such products in Denver had been neglected and that he controlled deposits of materials which could be used in products manufacture were also contributing factors.

The Magnuson Brick Company was formed and the concrete-brick plant was placed in operation in June, 1939. W. E. Dunn Manufacturing Company equipment is used throughout. After making a satisfactory start selling the Dunbrik, a Duntex roof-tile machine was installed early in 1940. This product has also met with success and Mr. Magnuson now plans to add vibrated concrete-blocks and floor-tiles to his line.

The equipment in this plant is a

standard Dunn installation designed for the utmost simplicity and efficiency. The aggregates and cement are elevated by a 1-cubic yard Dunn skip to the 1-cubic yard Dunn horizontal revolving blade mixer. A split-chute arrangement is used to feed the hoppers of the Dunbrik and Duntex machines.

The Duntex machine makes 10- by 15-inch corrugated roof tiles on pressed-steel pallets and has an automatic table off-bearer. It has a capacity of about 400 tiles per hour, which may be made plain, or in solid colors or they can be sprayed on the off-bearing table as they are made.

The continuous concrete-brick machine with spout from mixer above.

The Dunbrik machine is of standard design. The bricks are loaded on Dunn steel racks. Dunn lift-trucks are used to move the racks into the curing room where they are left for 24 hours before being removed to outdoor storage. When made with sand and gravel 240 bricks are obtainable from a sack of cement and their compressive strength averages 3,400 p.s.i. The bricks made with light-weight aggregates are about one-third lighter in weight and test about 3,200 p.s.i.

The bricks are made in 7 solid colors and many blended colors. A Dunn spray unit is used for Matglazing in many colors. Light-weight volcanic aggregates are available in several colors, including red, yellow and white, and these are used for special effects.

Feldspar and rhyolite are used in the aggregates to get different effects. The feldspar makes a smooth dense surface and the rhyolite takes the place of cinders.

A very hard and smooth finish similar to a glaze is made with silicates. This finish, in various colors, is applied both to the bricks and the tiles.

The installation of a vibrating block-machine is now under consideration to round out the company's line of products. Fence posts, sidewalk slabs and other specials are being made by hand. Any desired cast-stone products are also made to order.

A. P. Magnuson, one of the four sons Mr. Magnuson has with him in this business, built a house of Dunbrik and Duntex tile which served as a demonstration house to publicize the company's products. During the winter of 1939-40 the first large order was received. This consisted of 100,000 bricks for a 5-apartment building. Since then many large and small buildings of all kinds have been built with these products. A recent interesting job was a garage in which 67,000 colored face bricks were used both inside and outside.

The roof-tile machine with off-bearing table at left and spout from mixer above.

## Pipe Convention (from page 92)

government offices in order to get their share of this business. He brought out the fact that a minimum of 36 hours of curing in an established plant is required.

Mr. Loving, after making his annual report, went back into the history of the association and its efforts to get concrete pipe accepted for various uses by U. S. Army Engineering Department. He also described some of the specific problems involved, such as the amount of cover required to absorb the landing impact of a large bombing plane. He reminisced at length on the history of the industry and the association and the gradual formulation and growth of acceptance of concrete-pipe specifications. He closed by pointing out the importance to the industry of the present army, navy and general defense programs.

Later Mr. Loving opened the subject of *Safe Heights of Cover Over Concrete Pipe Lines* by discussing the action of concrete pipe under heavy fills. He cited many instances in which concrete pipe held up under fills far higher than any highway or railway requirement. He said that the association is ready for any comparative tests and held out the hope that limitations might soon be lifted. A number of the producers present joined in the discussion of comparisons between the various competitive types of pipe.

H. Eschenbrenner, Universal Concrete Pipe Company, Columbus, Ohio, and Mrs. Eschenbrenner.

Mr. Palmore, who presided over one of the meetings, said that the W.P.A. has discontinued the manufacture of pipe. This good news was compensated for by announcement of the entry into this field of the U. S. Forestry Service, the C.C.C. and the National Youth Administration. The last-named organization in particular is regarded as a real threat to both the concrete-pipe and concrete-block industries.

E. F. Bent, American Concrete & Steel Pipe Company, Los Angeles, California, and Mrs. Bent.

Much of the discussion at this meeting was devoted to the subject of airport drainage. Bulletin 22 of the Concrete Pipe Association entitled *Concrete Pipe for Airport Drainage* covers this timely subject and was quoted extensively. This bulletin was edited by Mr. Loving and describes the manner in which drainage problems were solved at a number of airports involving a wide variety of conditions.

# Utah Operator Supplying Large Pipe Sections for Deer Creek Aqueduct

TYPICAL of the many improvement projects under way in scattered sections of the country is the Deer Creek Aqueduct near Salt Lake City, Utah. This 40-mile aqueduct will bring water to a new reservoir and purification plant in that city from Deer Creek Dam, now under construction. Both the dam and the aqueduct are a part of the Provo River Project

**By W. E. TRAUFFER**

of the U. S. Bureau of Reclamation and water will be supplied to the Metropolitan Water District of Salt Lake City. The completed dam will have a capacity of 150,000 acre-feet. About half of the average withdrawal, 150 second-feet, will go through the aqueduct. An equal amount will be used for irrigation in the fertile Wasatch Valley southeast of Salt Lake City.

The dam in Provo Canyon is about 25 miles southeast of Salt Lake City and 13 miles northeast of Provo, Utah. The aqueduct will run southwest from the dam for 7 miles to the Olmstead Tunnel through the mountains 7 miles northeast of Provo.

Contracts have been awarded for the laying of 25,200 feet of concrete-pipe from the tunnel northwest toward Salt Lake City and for a 16,000-foot section of pipe beginning 8,000 feet further northwest. Other contracts will be awarded for the rest of the 35 miles of pipe to be used on this project.

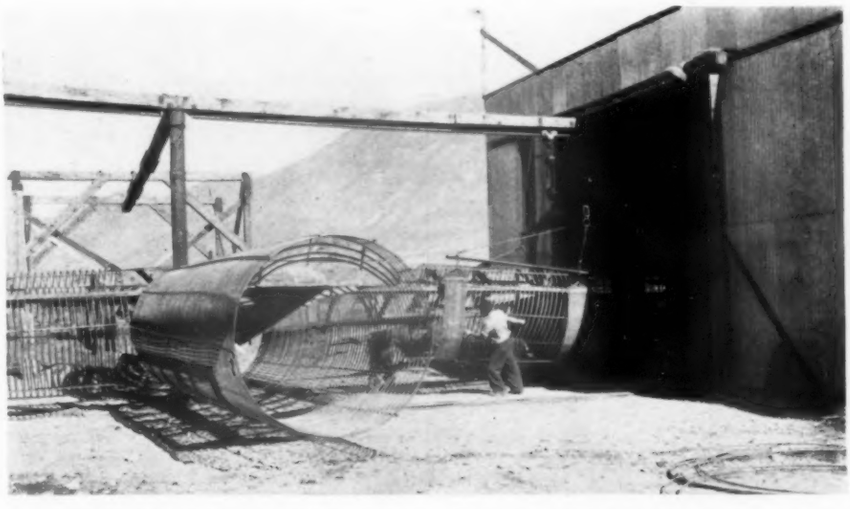
Late in 1939 the first two contracts were awarded to the Utah Concrete Pipe Company, an established concrete-products manufacturer in Salt Lake City. This company was formed in 1934 by Carl B. Warren and others. Mr. Warren has had a long and wide experience in the manufacture and use of concrete pipe dating back to 1919. He has operated pipe plants in Spokane, Washington and in other locations to supply pipe for storm-sewer and irrigation work in all parts of the Pacific Northwest including Canada. His Spokane Concrete Pipe Company now operates permanent pipe plants at Spokane and at Butte and Missoula, Montana. In February, 1940, Mr. Warren sold his interests in the Utah Concrete Pipe Company and took over the pipe contract for the aqueduct. He completed the plant which was then under construction and had it in operation on June, 10, 1940. M. S. Ross is in charge of operations.

Loading one of the finished 23-ton concrete-pipe sections on a truck-trailer for delivery to the aqueduct.

The pipe being used in this project is made in 20-foot lengths and is 69 inches in diameter. Each unit weighs about 23 tons. The units are of the bell-and-spigot type with walls 7½ inches thick. An average of over a ton of continuous steel-rod cage is used in each unit. Each pipe section requires about 10 cubic yards of concrete made from 6,000 pounds of cement and 12½ cubic yards of sand and gravel. A special 1¼-inch rubber gasket has been developed which fits in a groove in the spigot end of the pipe.

The sand and gravel are hauled to the plant in trucks from a temporary plant 3 miles away. A hopper and bucket-elevator are used to transfer the aggregates to a 75-cubic yard sand bin and a 100-cubic yard 2-compartment bin for ¾- and 1½-inch gravel.

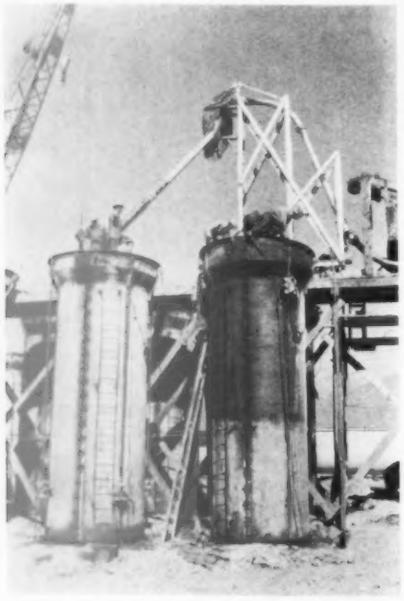
Bulk cement is received in box-cars on a spur track. It is unloaded by a power scraper to a screw-conveyor followed by a bucket-elevator which discharges the cement into a 250-barrel bin. Weighing of the concrete ingredients is done by a 1-compartment, 1-cubic yard Noble batcher with a center cell for cement. The aggregate-feed gates, the cement-feed screw and the batcher-discharge gate are controlled automatically by means of photoëlectric cells and air cylinders. The mixing water is measured by a Repeat-O-Matic meter.



Reinforcing cage being removed from mandrel in shop to revolving rack from which it is taken to be assembled.

The contents of the batcher and the water are discharged into a 1-cubic yard Chain Belt Rex concrete mixer. The concrete is discharged into a small car on an incline which in turn discharges it into the hopper of the Chain Belt Rex Pumpcrete machine. The latter pumps the concrete through a 7-inch pipe-line to the top of the concrete-pipe forms. At this point the pipe-line is connected by flexible couplings to a pipe on a car on a trestle. This car can be moved on rails to discharge concrete through a movable spout into four pipe forms at one setting. About an hour and 20 minutes is usually required to pour four pipe sections and the feed-line is then extended. The daily quota of 10 pipe sections is usually poured in about 4½ hours elapsed time. Four electric vibrators are clamped on each form to compact the concrete and they are moved to new locations up the forms as the pouring progresses. Cables and small hand-hoists are used to move the vibrators.

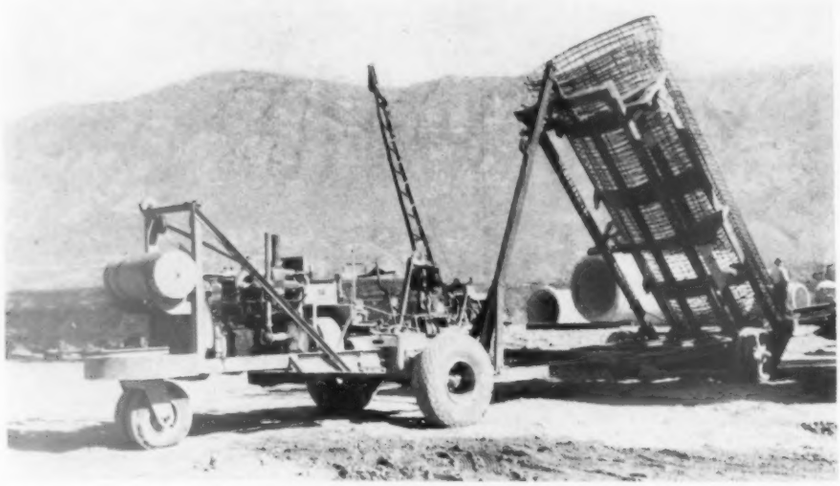
Crawler crane with an 85-foot boom placing reinforcing cage over the center form. Outer form is ready to be placed around cage.



Concrete being poured into one of the pipe forms through a pipe on a movable car.

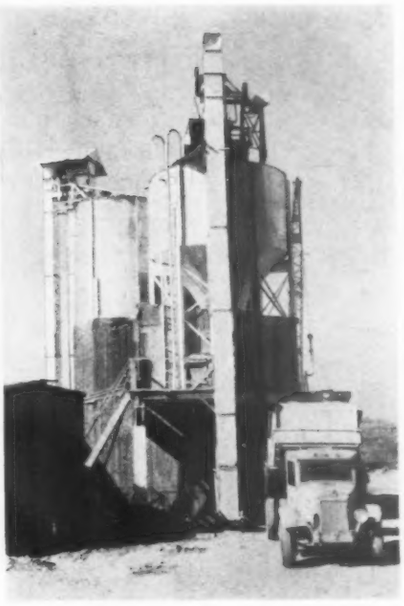
The day begins at 5:00 o'clock a.m. when stripping of the 10 pipe-sections poured on the preceding day is begun. Each section thus is steam cured at a temperature of from 100 to 130 degrees F. for 17 to 18 hours before the steel forms are removed. Then the wooden steam-boxes are put back in place over the pipes and they are further steam-cured for a total of 72 hours. About 6 hours are required to remove the forms and reset them in new locations and pouring begins about when this work has been completed. In this way only ten complete sets of forms are required.

The crawler crane lifting a cured pipe-section from its base for loading on a truck-trailer.



The special carrier, which was developed to carry the reinforcing cages to pouring site, with cage tilted for easy unloading.

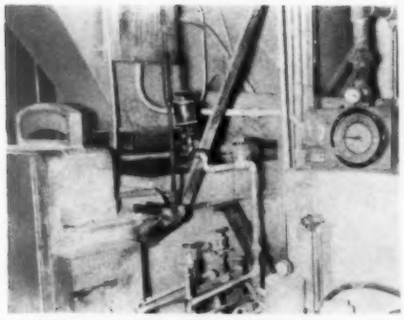
The completed set-up for each pipe section consists of a single inner form with a bell top and a head ring. Around this form is the double reinforcing cage which consists of two continuous steel-rod cages with a 3-inch space between them. These cages are tied together with wire and the bell-end reinforcing is tied on with wires. Around this goes the steel outer form.



The concrete-mixing plant with truck discharging aggregates in foreground.

Special crawler tractor lifting reinforcing cage to be loaded on special carrier.

Concrete being discharged from car into hopper of machine which pumps it into forms.

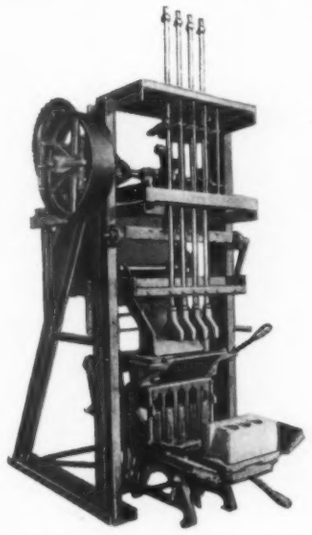


The 1-cubic yard cement-and-aggregate batcher with water-measuring meter at right.

An American Gopher gasoline crane with an 85-foot boom does all the moving and placing of forms and steamboxes. This crane also places and moves the finished pipe sections in place for loading on Kenworthy truck-trailers, which are used to deliver the pipe sections to the aqueduct. The actual loading is done by means of a cable operated by a hoist on each truck. A P & H pipe hustler, with a 30-foot boom is used to set the head rings, help move fininshed pipe sections, and to load the cages on a special carrier which hauls them to the forms. This machine consists of a semi-trailer hauled by a Caterpillar 60 tractor engine and drive mounted on a pneumatic-tired chassis. On the semi-trailer is a cradle for the cage. It can be tilted to set the cage on end so the crane can put it in place.

The reinforcing cages are made in a shop on the premises. Use is made of a mandrel that can be set at the right diameter for the inner and outer cage sections which are fabricated separately. The cross-bars and strips are wired in place after the cage is formed. The mandrel is then contracted and the cage is slid off on one of the four arms of a revolving frame. The cage carrier is used to move these cage sections into the yard, where the complete cages are assembled.

The pipe sections will be subjected to static pressure heads of from 50 to 125 feet at different points on the aqueduct. All the pipe sections are of the same diameter and thickness but 11 different types of steel reinforcing cages are used to meet these conditions. Four separate cage grades are made for static heads of from 0 to 50 feet, 50 to 75 feet, 75 to 100 feet and 100 to 125 feet. Four different depths of earth covers are used on the pipes in place. These depths are: 0 to 5 feet, 5 to 10 feet, 10 to 15 feet and over 15 feet. Reinforcing rods of four different cross-sectional areas are used for these different depths. These cross-sectional areas range from .60 inch to 1.58 square inches for the inner cage sections and from .42 inch to 1.05 square inches for the outer cage sections.

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The Hobbs Jr. Face-Down Block Machine is recognized everywhere as the great general purpose machine of the concrete-products industry. Famous for its wide range of sizes and the variety of blocks it can produce. As illustrated, it is equipped with striking and finishing device, shown under the floor-type tamper and with power feeder.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Jeltcrete, Stearns mixers, and Cast Iron and Press Steel pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

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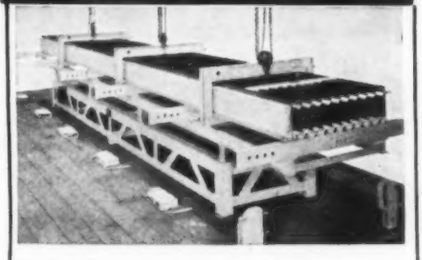

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***for* Concrete Joists**

These forms are made in standard 20-ft. lengths. Also special lengths to meet individual requirements. The illustration above shows method of removing complete set of poured joists, which permits multiple production where desirable or feasible.

**HEAVY DUTY VIBRATING TABLES can be furnished**

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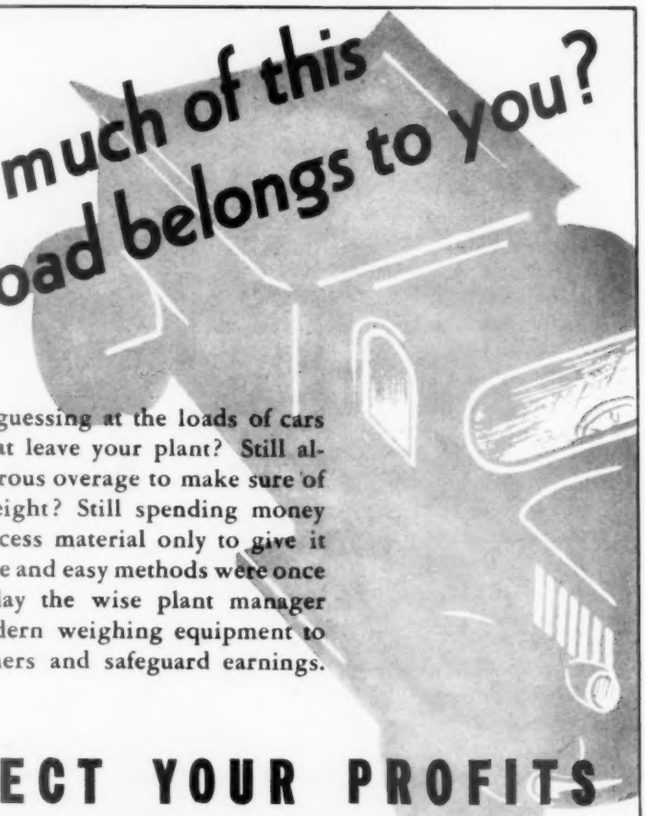
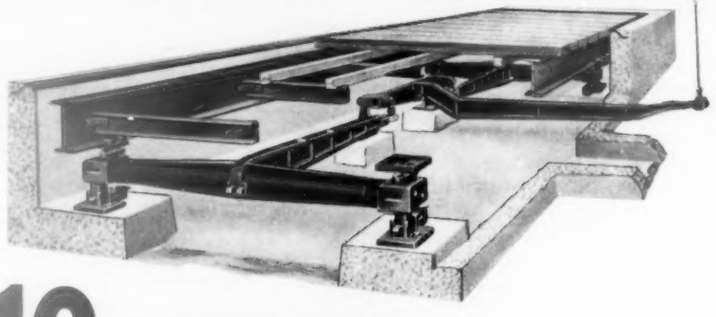
# How much of this load belongs to you?



Are you still guessing at the loads of cars and trucks that leave your plant? Still allowing a generous overage to make sure of giving full weight? Still spending money processing excess material only to give it away? Such free and easy methods were once habitual. Today the wise plant manager relies on modern weighing equipment to satisfy customers and safeguard earnings.

## PROTECT YOUR PROFITS with HOWE MOTOR TRUCK SCALES



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## Reservoir Supported by Precast Members

Precast concrete columns, girders and beams were selected recently at Ventura, California, in competition with other types of construction, for supporting a corrugated metal roof over a 4-acre reservoir in which the city stores filtered water. The reservoir itself, built in 1937, is a concrete-lined excavation with a capacity of 18,800,000 gallons.

During the time when comparative studies were being made on redwood and precast concrete as materials for the roof framework, a disastrous fire in a wooden roof over a reservoir at Berkeley, California, swung the decision to precast concrete because of its non-inflammable advantage.

There are 515 columns and a total of 9,688 lineal feet of precast girders, 8,487 lineal feet of precast struts and 36,224 lineal feet of precast purlins. Specifications required the concrete in precast members to have a strength of 3,000 pounds per square inch before they were transported and erected. Using local aggregates with six sacks of cement per cubic yard of concrete, it was found that the 3,000-pound strength requirement could be met on the fifth day and that by the 28th day test cylinders averaged 4,763 pounds.

Some of the precast members were made by Graham Brothers, Los Angeles.

## Let $748,000 Contract for Defense Concrete

Construction is under way at the site of the Remington Arms ammunition plant near Kansas City on a concrete-mixing plant that will supply most of the needs of this $18,000,000 defense project.

This concrete plant is being constructed under a $748,000 contract for 100,000 cubic yards of poured concrete awarded by the general contractors to two Kansas City concerns, the *C. A. Brockett Cement Company* and the *Kansas City Quarries Company*.

## Three Concrete Plants Serve Ordnance Job

Construction of three concrete plants is nearing completion at the Kingsbury, Indiana, ordnance plant, with a total capacity of 1,900 cubic yards of concrete per 24-hour day. These plants are being constructed as preliminary to the start of permanent buildings for shell-loading operations and storage.

The largest plant will have a daily capacity of 1,500 cubic yards.

# WEIGHING in the Nonmetallic-Minerals Industries

By C. H. SONNTAG
Formerly Plant Manager,
Lawrence Portland Cement Company

MANUFACTURING and processing plants may, for the purpose of this discussion, be divided into two classifications:

(a) Those in which the material being handled passes through the process in separate and distinct or discrete units or groups of units. Such are the manufacture of apparel, automobiles (both parts and finished cars), many machine-shop products, books, furniture, and other things too numerous to mention.

(b) Those in which the material goes through the process in a continuous stream. Sand, gravel, cement and crushed stone are in this class, and probably other things as well.

Production in group (a) can be quite accurately controlled, for counting or weighing, or both, of the separate units gives a correct inventory and a good basis for cost-keeping. Even if some of the product is held in a partly-manufactured state between stages of the process, it is still made up of individual units that can be counted or weighed. Since the processes in which we are interested are not conspicuous in this group, it will not be further considered.

The second group (b) includes all those that are collectively known as mineral products.

As has just been said, plants in this group have in common the fact that the raw material goes through them in a continuous stream, usually with no pause from the time it enters the plant until it is ready to leave it. All too commonly there is no real knowledge of how much material has entered the plant, no knowledge of the work done by individual machines, and none of the final product until it is sold. If the product is not uniform, but is classified and sold by size or otherwise, sales become an inventory of the finished product when it moves, but they tell nothing about the amount of each product still in storage.

To insure against machinery breakdowns or inclement weather it is not uncommon to store material in a partly-manufactured state, to be available in case the machinery that produced it is not running. The varying production of individual machines or steps in the process may be equalized in this way. Usually known as "surge storage," it may be in the form of bins or of open piles, frequently of irregular shape. An accurate inventory of material so stored is quite difficult to obtain, and if any attempt at accuracy is made, ascertaining the contents of these piles may become quite expensive, and call for some of the methods of civil engineering. Such inventories must necessarily be based on volume, which is converted into weight on the basis of some relationship that is usually the result of experience.

When the products are of several sizes or classes that must be made simultaneously but not necessarily sold that way, the temporarily unsalable sizes must be stored, and the usual inventory is subject to the limitations given above.

*Necessity for Weighing.*—More and more cost accounting is becoming an accepted feature of modern business. Old-time operators worked pretty much on a cash basis. They did not figure such things as depreciation and obsolescence of plant and depletion of the original supply of material. But such things are a part of the cost of doing business, and, particularly as to the last item, they must be based on an accurate knowledge of the through-put of the plant if they themselves are to be cor-

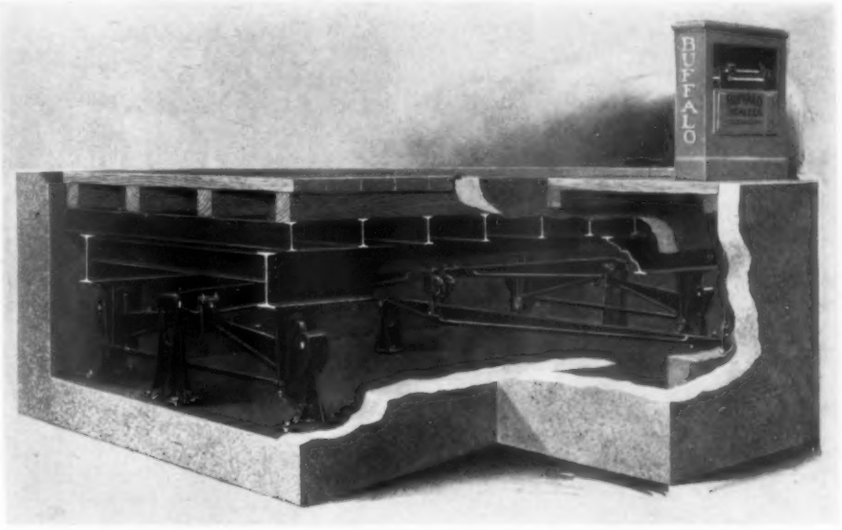



Figure 1. Standard motor-truck scale. (Courtesy Buffalo Scale Company.)

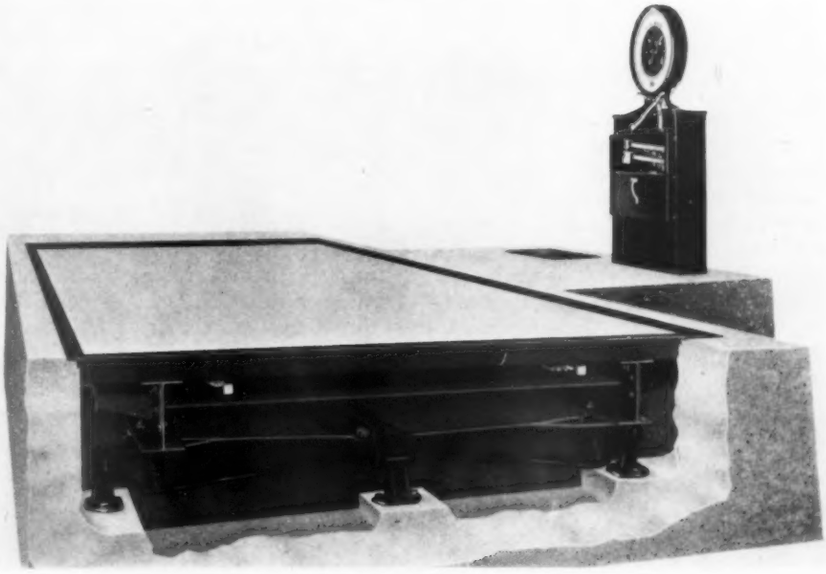


Figure 2. Truck scale with circular dial. (Courtesy Toledo Scale Company.)

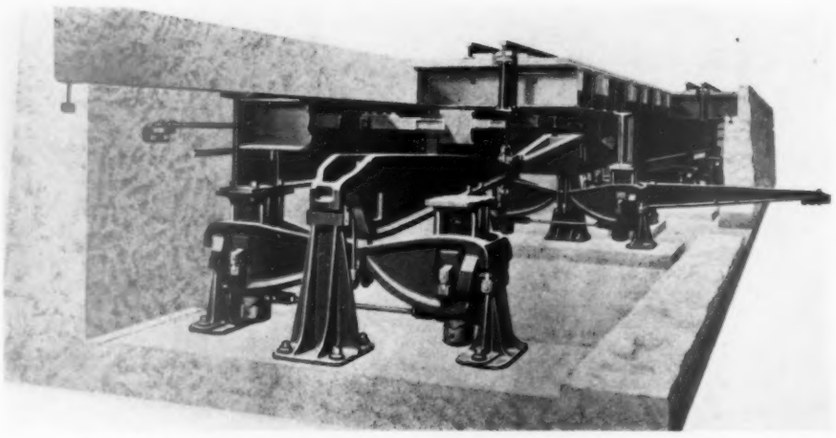


Figure 3. Four-section railroad scale. (Courtesy Fairbanks-Morse & Company.)

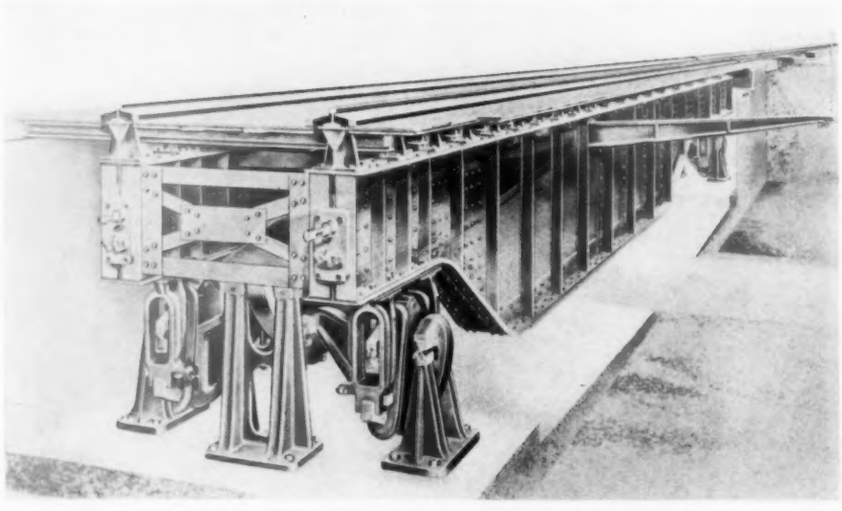


Figure 4. Two-section railroad scale. (Courtesy Howe Scale Company.)

rect. Such accuracy can be had only by weighing the material entering the plant, at some of the steps in the process, and the final product or products. Of course, such a statement must not be taken too literally and interpreted too rigidly. Some processes, such as the pumping of sand and gravel through dredge lines, are not adaptable to weighing. But in general, scales give the basis for cost-accounting, and may also give information as to the value of modifications of machines.

*Incoming Material.*—Material may come to a plant suspended in water from its own dredge, comparatively dry from its own gravel bank or quarry, or by truck or railroad car. In a few instances material is delivered to a plant by aërial tramway. When sand and gravel are pumped to a plant, or are excavated under water by a bucket on a slack-line cableway, and are carried through the process by water, there is no opportunity for weighing.

Gravel excavated from a dry bank, or rock taken from a quarry, is usually loaded into dump cars or motor trucks of some sort. Such dump cars can be weighed on track scales, but since they are comparatively small a scale like a motor-truck scale, with rails on its platform if necessary, would seem to fill the bill. Such a scale is shown in Figure 1 (Buffalo). Scales of this type usually have the customary beam and sliding poise which can be arranged to print tickets, but they may have a circular dial, illustrated in Figure 2 (Toledo), for quick and easy reading.

When the pit or quarry uses motor trucks instead of cars on rails, exactly the same style of scales may be used. These motor-truck scales are a logical development of the old wood-frame wagon scale that used to grace every country town and some farms. The pits are nearly always made of concrete now, but it is still optional whether to make the platform of concrete or planks. Planks are cheaper and more easily applied, but they wear out or rot, the cracks between them get wider as they shrink and allow dirt to fall through on the mechanism, and they change weight by absorbing water and so alter the zero setting of the scale. A concrete platform costs a little more in the first place, but it is far better in performance, permanence and appearance.

Loaded standard railroad cars coming into a plant should be weighed on a regular railroad-track scale. Commonly these are offered in two styles—the older four-section construction, which usually has both live and dead rails, and the newer two-section, which may be used without dead rails, as it is heavy enough to stand a moderate amount of traffic moving over the platform without stopping.

Figure 3 (Fairbanks-Morse) shows the four-section type, and it will be noted that each longitudinal lever constitutes a section. Figure 4 (Howe) illustrates the two-section construction. The only platform supports are near each end, so very strong girders under the rails are required.

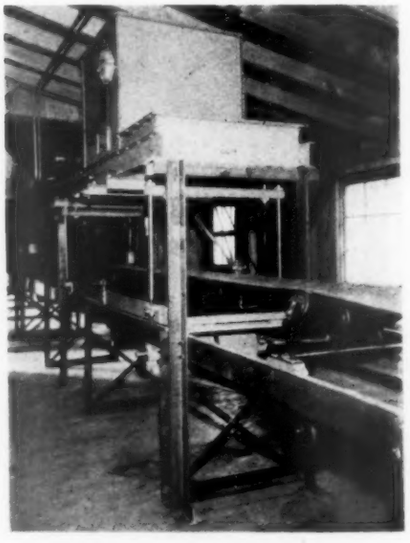


Figure 6. Weightometer on conveyor. (Courtesy Merrick Scale Manufacturing Company.)

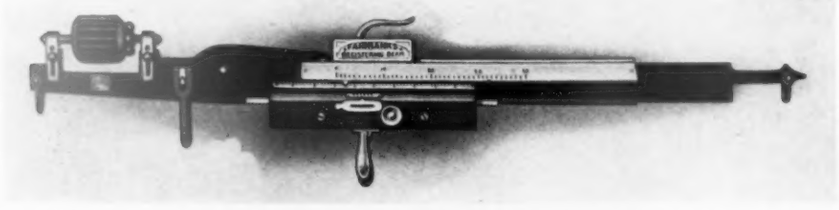


Figure 5. One type of registering beam. (Courtesy Fairbanks-Morse & Company.)

Weight registration and recording are commonly done on what is known as a type-registering beam, of which

Figure 7. Belt-conveyor scale. (Courtesy Fairbanks-Morse & Company.)

one style is shown in Figure 5 (Fairbanks-Morse). Beams by other makers are very similar. After balancing the scale empty, with the poise set at zero, by means of the adjustable counterweight on the short end of the beam, the load is balanced by moving the poise out and setting its pawl in the appropriate notch on the beam. Closer balance can be had by moving the smaller poise. The lower edge of the beam carries type figures corresponding to the graduations. If a scale ticket is inserted in the slot provided for it and the lower handles of the poise are squeezed together, an impression of the weight will be made on the ticket, which is made of soft paper like blotting paper so as to take a good impression but not injure the type.

Track scales may be had with circular dials such as shown in Figure 2 (Toledo). They may also be had with elaborate devices for printing on continuous tape or on special forms.

Special scales are available for weighing loads coming in on aërial trams, but such applications are so uncommon that it is not worth while to go into details concerning them.

With any of these scales the net weight of the load is obtained by weighing the empty vehicle and subtracting this from the gross weight. The standard scale ticket and type-registering beam make provision for showing gross, tare and net weight on the same ticket.

*Material in Process.*—Many, if not most, mineral plants consist of two parts: the first, where the material is screened and crushed to a limiting maximum size; and the second, where the material is further screened and classified. In cement plants this second part frequently takes the form of a storage served by an overhead electric crane, but in any event delivery from the first part is apt to be made by belt-conveyors. Special scales have been developed for weighing and totalizing the load passing on a belt- or pivoted-bucket conveyor. They are built around the idea of making a scale platform of part of the belt runway. To totalize the load for any given time, as a day, the element of belt speed must be considered, and this is taken from the belt itself.

The Merrick Weightometer has been on the market for quite a number of years, and has given its name to that class of scales that weigh and totalize the weight of material in transit. Its usual form is shown in Figure 6, which indicates that a part of the upper belt runway is separated from the rest and used as a suspended scale platform. This design assumes that the weight of the empty belt is constant, but in cases where the material being weighed is of a sticky nature and some of it adheres to the belt on the return run, the scale may be so designed as to take account of this and cancel it out. We need not go into the details of the totalizing mechanism, but the illustration shows a roller riding on the return side of the belt, thus obtaining the speed element for totalizing.

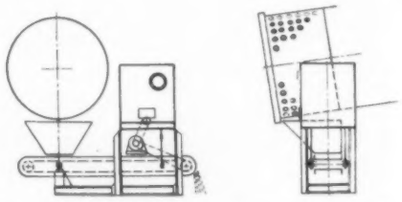


Figure 9. Pivoted conveyor scale beneath cooler. (Courtesy Merrick Scale Manufacturing Company.)

There are several other scales of this same general type on the market. Two of these are illustrated in Figures 7 (Fairbanks-Morse) and 8 (Toledo Chronoflo).

Sometimes material in process is too hot to be handled on an ordinary belt, and resort must be had to metallic conveyors of the pan or pivoted-bucket type. For such cases "weighing-in-transit" scales of the class just described

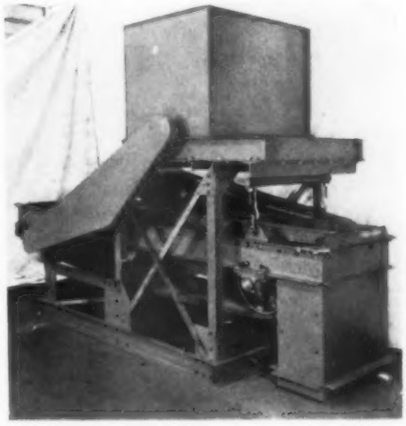


Figure 10. Conveyor scale with weighing frame pivoted at far end. (Courtesy Merrick Scale Manufacturing Company.)

can be designed to weigh the load on the same principle, though the installation may be more cumbersome and expensive.

Falling in this group are scales for weighing material coming from driers, and clinker from rotary coolers, which seldom bring the clinker down to a temperature such that it can be held in the hand. Space, and particularly vertical space, is usually at a premium under the discharge ends of driers and coolers, and scales requiring the least amount of head room are desirable. Figure 9 (Merrick) shows in outline

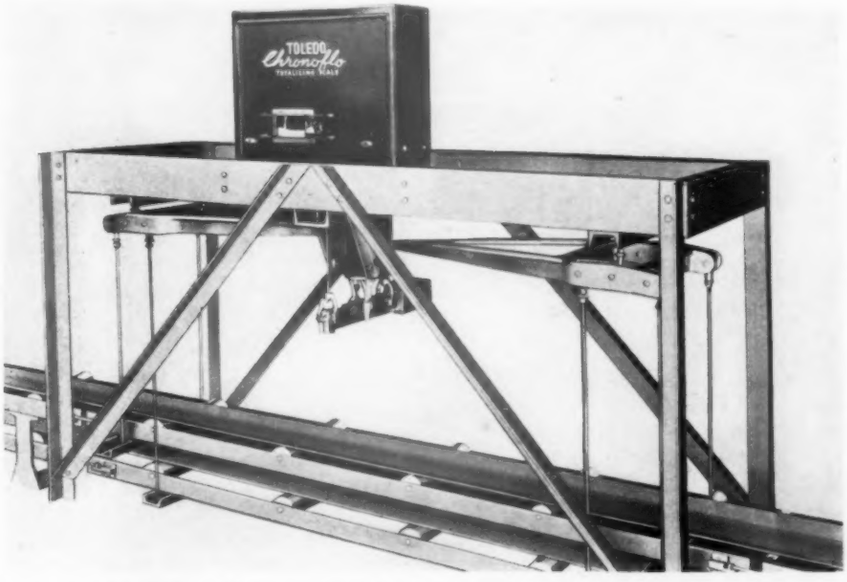



Figure 8. Belt-conveyor scale. (Courtesy Toledo Scale Company.)

a scale for such a purpose. This, like the machines next described, is pivoted near one end.

The usual scale of the weighing-in-transit type isolates a section of the conveyor run some distance from the ends, and uses it as if it were a scale platform. Where the conveyor is short, and perhaps installed only that weighing may be done, the whole conveyor frame may be pivoted at one end, as shown in Figure 10 (Merrick). The free end moves up and down, and operates the weighing and totalizing

Figure 11. A hopper scale. (Courtesy Richardson Scale Company.)

mechanism in accordance with the load being carried and the speed of the conveyor.

When head room is available the hopper type of scale makes a good installation. While "comparisons are odious," it is likely that this scale, properly maintained, is the most accurate of automatic scales, but it must be adapted to the material being handled, and is not suitable for finely-

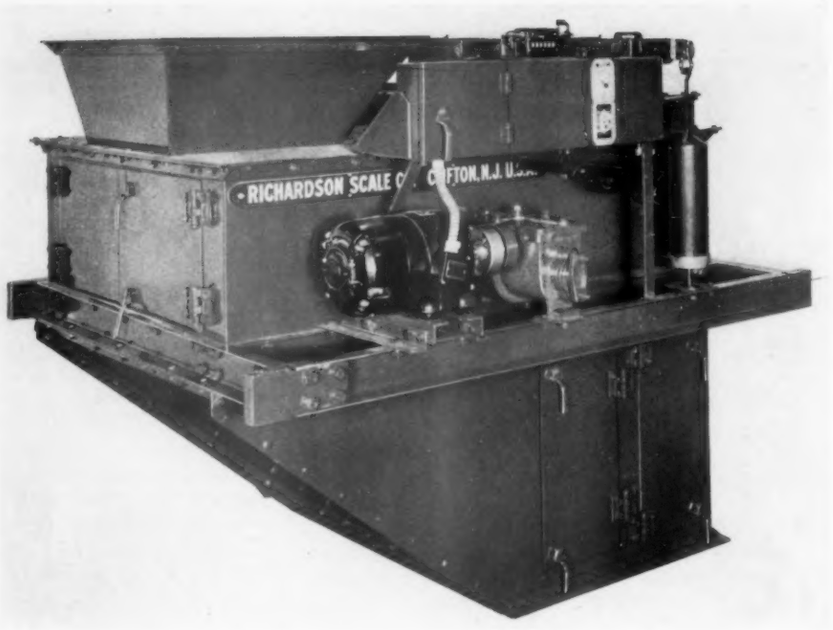



Figure 12. Inclosed hopper scale for weighing coal to pulverizer. (Courtesy Richardson Scale Company.)

powdered substances. Its best field is the weighing of granular substances, such as chicken grits, slate granules, the smaller sizes of crushed stone, small coal and similar commodities. Figure 11 (Richardson) illustrates one type of such a scale. When selected of the proper size, and with the receiving hopper adapted for the purpose, it may be used as a bagging scale.

Some industries use powdered coal as fuel. This is frequently prepared in "unit pulverizers"; that is to say, each pulverizer prepares fuel for a single furnace or kiln at the rate needed at the moment for that one furnace. These mills are provided with adjustable feeders which govern the amount of coal fed to the furnace, since there is no fuel storage between the mill and the furnace. It is important for cost-keeping purposes, and often vital from the operating standpoint, to know how much coal each mill and its associated furnace use. This information may be had at no increase in operating cost by installing an automatic scale ahead of each mill. It can be arranged in such a way that a supply of coal is always ready for the mill, but no more is fed than the mill calls for. A scale for this purpose, enclosed in a dust-tight housing, is shown in Figure 12 (Richardson).

Of course, scales of this type may be used to feed pulverizers of other kinds or handling other materials, such as grinding limestone for agricultural use.

Cement mills and ore-dressing plants are probably the largest users of ball-, rod- and tube-mills and combinations of them. There does not seem to be any thoroughly satisfactory weighing-feeder for tube-mills, but the feed for ball- and rod- mills is so coarse that automatic scale feeders can handle it

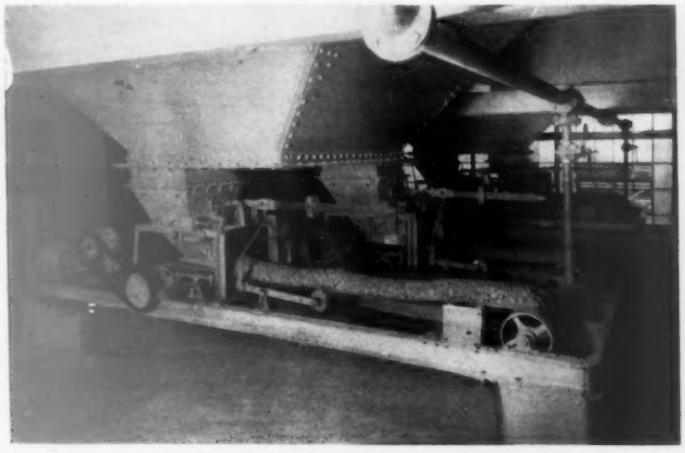


Figure 13. The Poidometer conveyor scale. (Courtesy Schaffer Poidometer Company.)

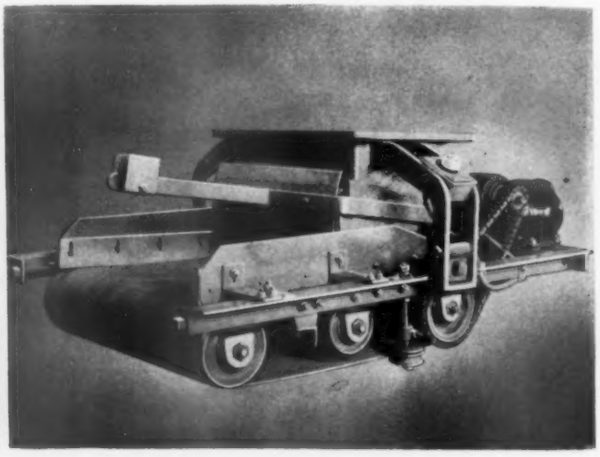


Figure 14. A constant-weight feeder. (Courtesy Hardinge Company.)

well. It is desirable to feed these mills with a practically-continuous stream, rather than by large batches dumped at once, with a considerable time interval between batches.

One type that feeds continuously and is used quite extensively is shown in Figure 13 (Schaffer). Its essential is that a section of moving belt carrying the material to be weighed shall balance a weight on a scale beam. This beam controls the gate through which material is fed to the belt. If the load on the belt becomes heavier than is called for by the setting of the poise on the beam, the gate is partly closed and *vice versa,* so that a practically-constant feed is secured. Several of these feeders, each handling a different material, but dumping into a common receptacle, may be interlocked so that if one stops, or its supply fails, all will stop, so that a mixture of constant proportions is always obtained. These machines are in use in cement making for mixing limestone and clay or shale, as well as other substances when needed, and also for mixing clinker and gypsum in the proper ratio.

The scale consists essentially of two pan-conveyors. The frame of the upper one is pivoted in such a way that if the supply of material fails the conveyor frame will tilt, and by operating certain mercury switches, stop the whole scale. Each conveyor has its own motor drive. The lower conveyor with its frame and drive forms the weighing part, being suspended on scale levers and balanced by a beam and weights in the usual way. The upper conveyor runs intermittently, and only long enough at one time to put the set weight of material on the lower conveyor. The latter runs continuously, and gives the grinding mill a practically-constant feed. Notwithstanding that, the "Convey-O-Weigh" is a batch feeder, each lot of material on the lower conveyor being separated from the ones ahead of and behind it by intervals long enough to permit the scale to come to balance. The scale illustrated consists of two complete units, one weighing clinker and one weighing gypsum, so interlocked that if the feed to either fails, or one stops, both will stop.

As with some of the devices already described, two or more of these scales may be interlocked so that all or none must run. Thus, they may be used for mixing clinker and gypsum or the constituents of the raw mixture in cement mills. They may also be used to weigh the output of coolers, since the tilting feature of the upper conveyor insures a full stream of material or none at all.

If the lower conveyor is driven by a variable-speed device, preferably a direct-current motor, the scale becomes a reliable feeder for its associated mill, besides weighing all the material that passes through it.

*The Finished Commodity.*—The outputs of many minerals plants are granular, and can be weighed by some of the scales described. Shipment is either in bulk or package. Granular substances shipped in bulk can be weighed in automatic hopper scales, or on those of the traveling-belt type, or on track scales, in this last case taking account of the weight of the empty car. It may be required that some granular commodities be shipped in bags. Hopper scales may easily be adapted to put weighed amounts into bags, which are later closed.

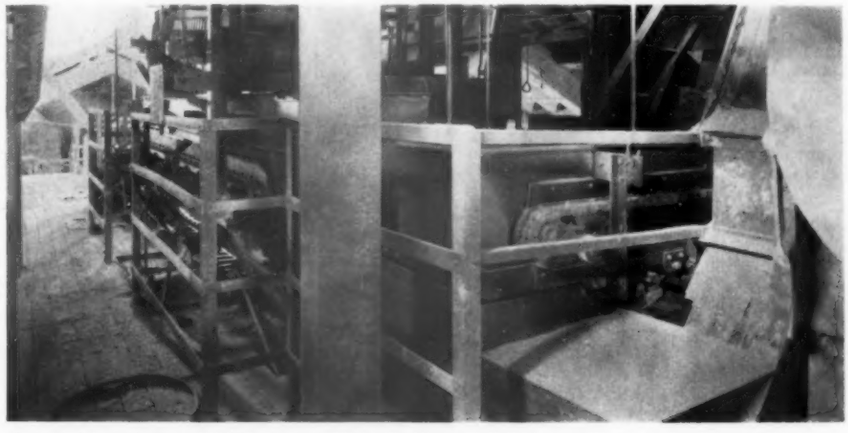


Figure 15. Convey-O-Weigh proportioning clinker and gypsum. (Courtesy Richardson Scale Company.)

The "constant-weight" feeder works on somewhat the same principle as the foregoing, except that the entire belt frame is pivoted at one end. The motion of the free end up and down caused by variations in the load operates a gate to regulate the flow of material. A good idea of the "constant-weight" feeder may be had from Figure 14 (Hardinge). Two or more of these machines may be interlocked so as to maintain constant proportions in the mixture being made.

Either of the two machines last described will serve as feeders for ball- and rod-mills or for mills of the combination type. Another that does a very good job is the "Convey-O-Weigh" shown in Figure 15 (Richardson), which is a photograph of one of them proportioning a mixture of clinker and gypsum for pulverizers.

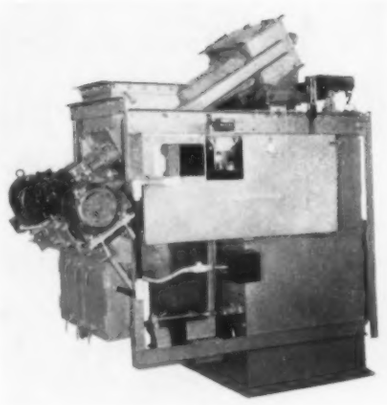


Figure 16. Scale for powders such as cement or talc. (Courtesy Richardson Scale Company.)

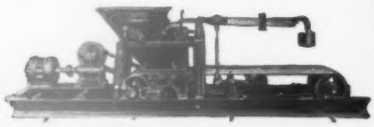
Some products, as cement and ground limestone, are so fine that they will run through any of the common types of automatic scales. To meet this condition and insure accurate weighing, one manufacturer offers a scale in which the material is retarded and controlled by means of inclined screw-conveyors. Figure 16 (Richardson) is an illustration of such a machine. It is a batch scale, and can be used for weighing bulk material into cars or as a bagging scale, and can be made dust-proof, which is an important feature when handling fine dry powders.

If an automatic scale is suspended from and attached to an overhead bin or hopper, it should not be in rigid contact with anything underneath. If supported from below, there should be some sort of flexible connection between the scale and the overhead hopper. Observation of this precaution will insure that settling or other move-

Figure 17. Dormant scale with circular dial and tare beam. (Courtesy Toledo Scale Company.)

The CONCRETE MANUFACTURER

PROPORTION BY WEIGHT



WITH POIDOMETERS

Many cement plants are using Poidometers for proportioning raw and finish materials, and also cement and hydrated lime for Masons cement. Poidometers are also being used for feeding materials to grinding mills, and coal to dryers. The Poidometer is self-contained. The scale beam is graduated in pounds or kilos, and can be set at whatever amount of material may be required per foot of belt travel; the gate is then adjusted to suit this weight, and the machine will deliver the pre-determined amount of material with an accuracy of ninety-nine per cent.

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ONE Machine for ALL Size Pipe

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Universal "all purpose" concrete pipe machine produces quality pipe at lowest cost, because it requires smaller investment, insures greater footage per bag of cement, and more pipe per man.

Start the concrete pipe business with Universal equipment, and you will be sure of maximum profits.

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Columbus Ohio

ment of the hopper shall not affect the accuracy of the scale.

*For General Weighing.*—There are many instances in which specialized scales, such as most of those described,

Figure 18. A portable platform scale. (Courtesy Howe Scale Company.)

will not serve the purpose, and use must be made of types that are familiar to everyone. Where the setting is permanent, the so-called dormant scale is an excellent one. These scales are common in grain-and-feed stores and warehouses, but their commonest applications in the mineral industries are where barrels, wheelbarrows or buggies are to be weighed and perhaps made up to a standard weight. They may have the common beam and poise, but in their best form they have a circular indicating head such as illustrated

Figure 19. Sensitive over-and-under indicator on ordinary platform scale. (Courtesy Exact Weight Scale Company.)

in Figure 17 (Toledo). Such scales are particularly useful in lime plants, where lump lime must be packed in barrels of uniform weight, and where carts or buggies of lime from the kilns are to be weighed on their way to railroad cars for shipment in bulk.

For weighing in widely-separated places, where the job is only occasional and a permanent setting is not called for, nothing can beat the common portable platform scale, such as shown in Figure 18 (Howe). Weighing the ball loads in ball- and tube-mills is one instance. Weighing the hammers in a hammer-mill so that they may be properly balanced and not cause vibration at running speed is another. These scales are usually mounted on wheels, so that they may be easily moved from place to place.

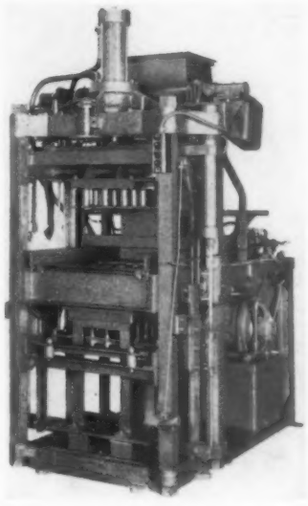
For weighing which demands special accuracy the device known as the "Exact Weight" attachment, shown in Figure 19, is excellent, as it multiplies the apparent sensitiveness of the ordinary platform scale very much. It is simple, consisting of a single lever whose short end is connected to the short end of the beam that is part of the platform scale. This lever is covered by a dust-protective metal box with windows, through which the action of the lever may be seen. This attachment is commonly used for indicating "over" and "under," and in that form provides a scale for checking weights of bags coming from bag-packers, or for hand-packing of commodities that are shipped in such small tonnages that automatic packers are not justified.

*General.*—Scales are not production machines, for they do not alter the properties of the materials passing over or through them. They are almost essential when two or more substances are to be mixed in definite proportions. They insure that the customer receives goods of correct weight. For these purposes scales will be bought because the need for them is apparent. But there are many potential uses for them where, besides possibly guiding the operators, they are really accounting machines, just as much as the cash register in a store. Properly used, they prevent over- and under-runs of inventory, and keep the cost department in daily touch with plant operations. There should be many more scales, automatic where possible, used in the minerals industries than are at present installed.

---

The Woodstock Concrete Pipe Company, Woodstock, Ontario, is erecting a branch plant on Snyder Avenue in North York township, near Toronto. The plant, which will cost over $15,000 to build, is to replace an older structure.

Precision Production of Concrete Blocks



KENT HYDRAULIC VIBRA PRESS

VIBRATION-PRESSING

2 to 4 Blocks per cycle

KENT MACHINE CO.
Cuyahoga Falls, Ohio

## Billiter Concrete Company Is Sold "Across River"

The Ready Mixed Concrete Company of Covington, Kentucky has purchased the plants and business of the Billiter Concrete Company of Newport, Kentucky.

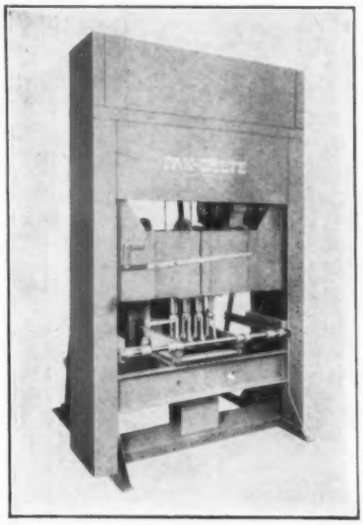
The two properties are located within a stone's throw of each other on opposite sides of the Licking River. Fred J. Miller and Stephen Malony, the owners, have also announced plans for the expansion and improvement of the two properties. Sixteen truck-mixers are now operating out of the two ready-mix plants while concrete blocks are produced at the Newport location.

## Universal Re-Enters Machinery Field

Articles of incorporation have been granted the Universal Tamping Machine Company, Peoria, Illinois, for the manufacture of concrete-products machinery. Incorporators include Charles, Glenn and Gerald Emert and Howard Brooking, all of Peoria.

The re-entry of Universal, one of the old, well-known names in the concrete-products industry, reflects the prosperity which the industry is enjoying in general.

A LOT OF MACHINE FOR A LITTLE MONEY



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PRECISION MADE—QUICK DELIVERY

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ONE MAN HANDLES 48 BLOCKS
NO BREAKAGE

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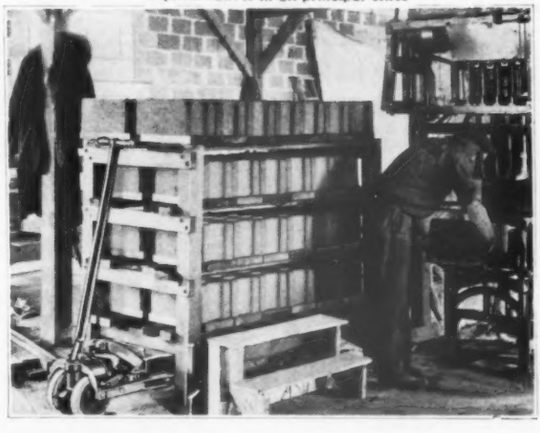
Representatives in all principal cities



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Bins can be extended to give greater storage capacity. Trolley, Scale and Weigh Hopper offered as a unit to those who desire to build bins. Write for facts on this unit.

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Quinn Heavy Duty Pipe Forms are built to give more years of service — sizes for any diameter pipe from 12 to 84 inches — tongue and groove or bell end pipe — any length. Backed by over 30 years of service in the hands of contractors, municipal departments and pipe manufacturers.

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Our Heavy Duty type with Adjustable Locks is shown above. Quinn Heavy Duty Forms are also available with a new wedge-type lock.

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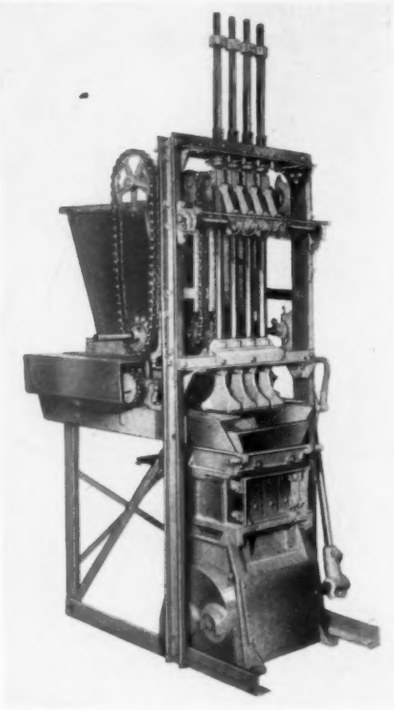

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**The Miles Manufacturing Company**

**Dept. 2, Jackson, Michigan**

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**Please take notice that the Stearns Manufacturing Company of Adrian, Michigan, are the sole and exclusive licensees of "Joltcrete" vibration block machine patents and patent rights and have the sole and exclusive right to manufacture and sell such equipment.**

**At the present time there is a suit for patent infringement pending against H. W. Bell Company of New York City, a user of infringing equipment.**

**Others manufacturing infringing equipment and the users of such equipment will be prosecuted to the fullest extent of the law.**

## LOUIS GELBMAN, *Inventor*

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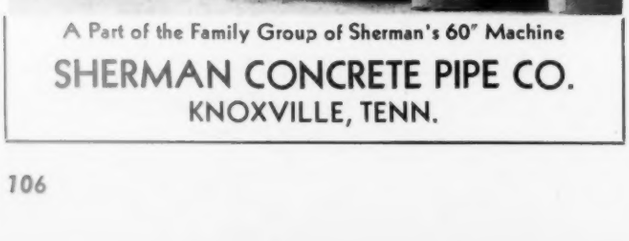

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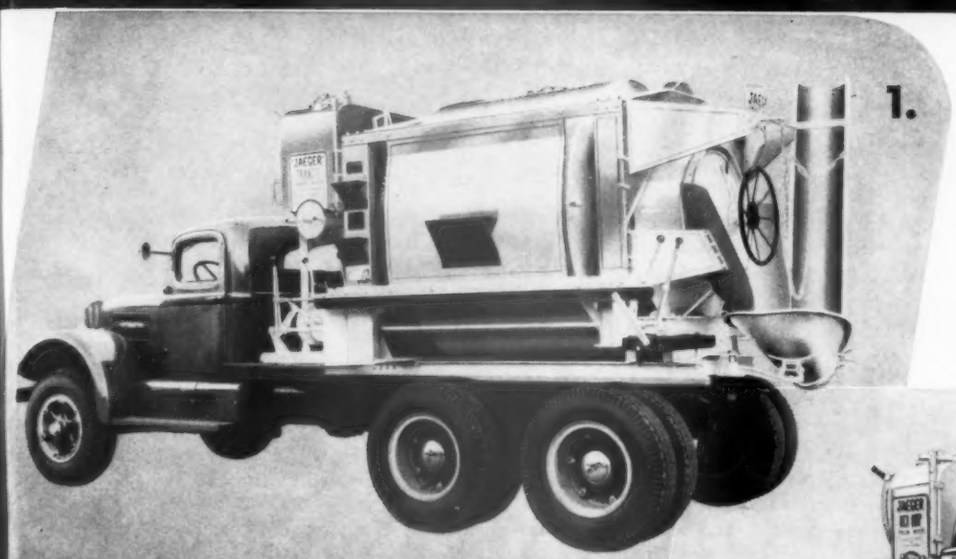

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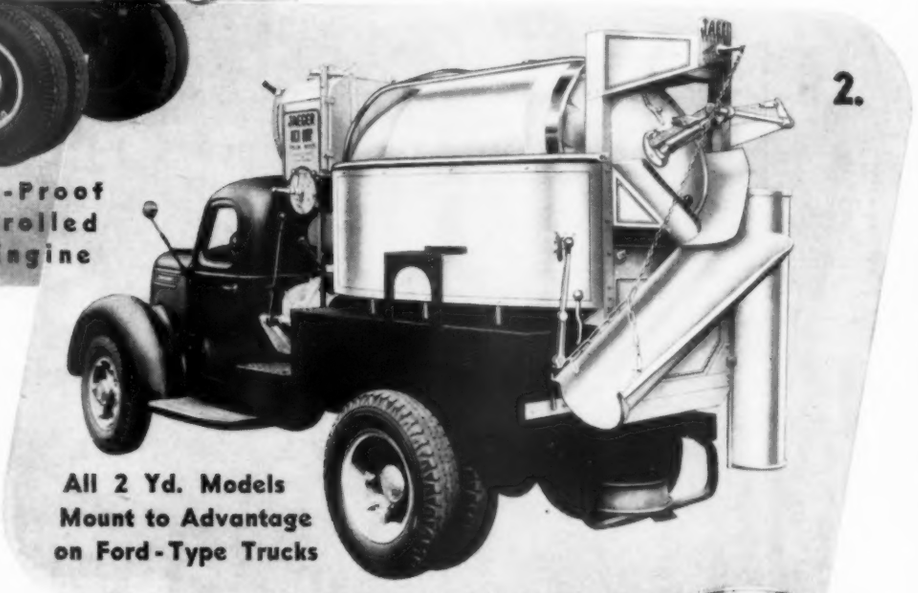
**Type:** Lowest, most economical to load; fastest on the market to mix and discharge — produce maximum daily yardage of proven higher strength concrete. Sealed drum meets any specification. Sizes 2, 3, 4, 5, 5½ yds.



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**(2) Top Loading Models with "Sealed Drum"**

**(3) Or Combination Top and End Loaders (Pat'd)**

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"Sealed Drum" Models take full load in one quick drop through the top. Fast Vacuum-Controlled Discharge Door seals against loss of moisture and heat in winter concrete.

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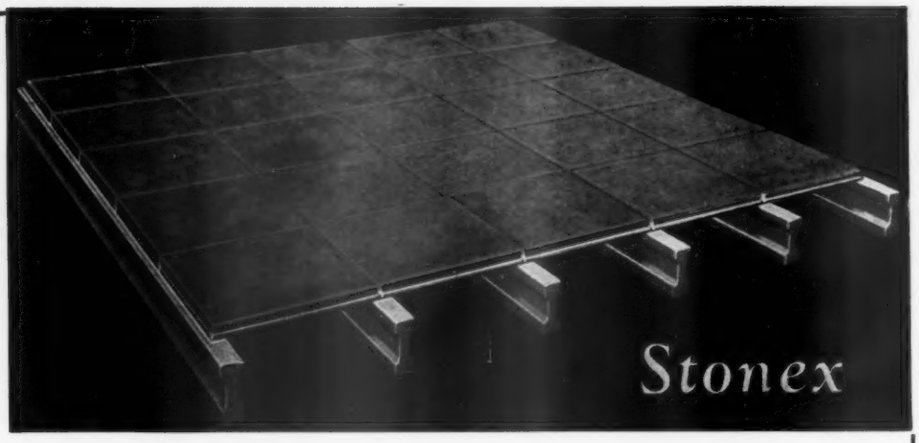
The CONCRETE MANUFACTURER

# HERE'S A NEW *LOW-COST* CONCRETE FLOOR




Here is a practical answer to the question "How can we get a good low-cost, finished concrete floor?

Precast concrete joists open the door to the low-cost floor market. STONEX clinches the sale by solving the problem of a floor finish.

The illustration above shows how simple the tile are to place . . . the speed with which a floor can be completed . . . the distinctive result that is obtained, at an amazingly low cost.

The new and exclusive STONEX process enables products manufacturers to produce—at low cost—tile of all shapes, sizes, and for all purposes . . . tile that are harder than granite, as proved by laboratory tests . . . in beautiful colors; all shades, tones and blends, that are an integral part of the tile itself.

The system has been perfected and proved by test and job experience. It is all ready for alert products manufacturers to merchandise. It is just what you need to win your local floor business.

*Write today for more details about STONEX process and our plan to license manufacturers to make and sell this system*

**STONEX INDUSTRIES, 500 N.W. 79th Street, Miami, Florida**

BLAW-KNOX PORTABLE BULK CEMENT PLANTS "Have everything"

SHIPPED IMMEDIATELY FROM STOCK

They pay for themselves in savings

A complete job ready to go to work. They include:

- Cement storage bins in a complete range of capacities, both portable and knockdown type, including steel roof for the storage bin.
- Weighing batchers for cement, of any size required, equipped with either beam scales or springless dial scales—manual or automatic types.
- Conveying equipment for elevating cement into storage bins with necessary unloading equipment for receiving cement in hopper bottom cars, box cars, or from truck delivery.
- Power unit and drive for conveying equipment, either gasoline or electric.

AND ACCURATE BATCHERS

Interesting Blaw-Knox Bulk Cement Plants are fully described in Catalog No. 1566. Write for a copy.

BLAW-KNOX

BLAW-KNOX DIVISION of Blaw-Knox Co.
FARMERS BANK BLDG., PITTSBURGH, PA.

35

BLAW-KNOX BINS AND BATCHERS • ROAD FORMS • STREET FORMS • CONCRETE SPREADERS • TAMPING ROLLERS • VIBRATORS
CONCRETE BUCKETS • CLAMSHELL BUCKETS • TRUCK MIXERS • STRIPING MACHINES • TURNTABLES • ROAD FINISHERS • STEEL FORMS

HOTEL BARLUM

Now one of the ALBERT PICK HOTELS

21 FLOORS OF OUTSIDE ROOMS

EACH WITH COMBINATION TUB & SHOWER

From $2 DAILY SINGLE

CADILLAC SQUARE AT BATES STREET

DETROIT

SAUERMAN
*Long Range*
MACHINES

HANDLE pit or bank excavation, stripping, stock piling, or reclaiming at lowest possible cost and a *higher profit to you with* a SAUERMAN Power Drag Scraper or Cableway Excavator.

Below is shown a SAUERMAN Slackline Cableway moving gravel from a pit 110 ft. deep to the top of screening plant at a rate of 90 cu. yd. per hour and at a cost of less than 5c per yard.

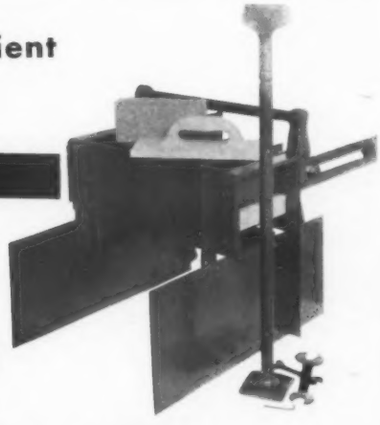
This is just one of the many plants, both large and small, where SAUERMAN Machines are making exceptional profits for their operators by digging, hauling and dumping in a straight line operation controlled by one man.

**SAUERMAN BROS. Inc.** 434 S. Clinton St. Chicago, U. S. A.

Scrapers and Cableways Since 1909

*Write for Catalog and Advice on Your Problems!*

**15% More Efficient for "41"**



**LITTLE DAVE BRICKMAKER**

The New Improved LITTLE DAVE BRICKMAKER is a low-cost high-production hand-operated machine that makes 7 standard brick on edge at each cycle. Sturdily built, easy to operate, it will enable you to get your share of the brick business and earn a decent profit while doing it. Units are square, sharp-edged and smoothly troweled. Users report outputs of 3,000 to 4,000, per day, at a cost for labor and materials of about $6 per thousand. Write today for complete details.

**R. F. REED COMPANY**
412 E. Michigan Ave. Three Rivers, Michigan

**One Good SMITH-MOBILE Deserves Another!**

Pacific Coast Aggregates, Inc. sent in their initial order for two Smith-Mobile Truck Mixers in July 1939. Another order for two machines followed the same month — three more in October 1939 —three more in November 1939 — seven more in February 1940 and three more in January of this year.

Surely, such preference must be deserved. The many repeat orders came as a result of satisfactory performance. The company liked the HIGH DISCHARGE feature . . . CONTROLLED DISCHARGE without segregation . . . VISIBLE MIXING . . . Fast FEED CHUTE Charging . . . Greater hauling capacity . . . Larger radius of spout distribution, etc.

4 sizes available — 2 cu. yds. to 5 cu. yds. as truck mixers — (2½ cu. yds. to 6 cu. yds. as agitators). Write for catalog 198-A.

**The T. L. SMITH COMPANY**
2887 N. 32nd STREET, MILWAUKEE, WIS.

Part of Pacific Coast Aggregates, Inc. fleet of 20 Smith-Mobiles

**SMITH-MOBILE**
THE *Modern* TRUCK MIXER and AGITATOR

A 3146-½

The CONCRETE MANUFACTURER

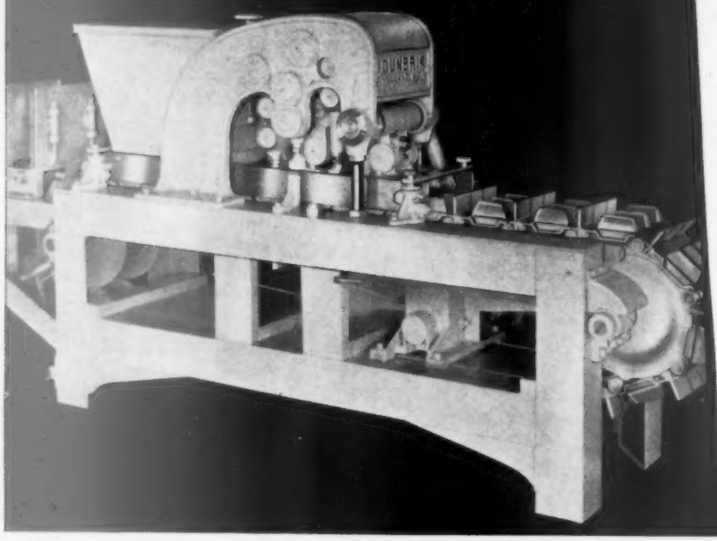
# PROFIT BY READING SMITH'S LETTER

and learning about scores of other successful Dunbrik Manufacturers — how they dominate the brick business in their protected territory.

Write today for free book "4 Keys to Success" and see how easily you too can own a profitable business.

**W. E. DUNN MFG. CO.**

420 WEST 24TH ST. HOLLAND. MICH.



STONE AGGREGATES PRODUCER — CONCRETE PRODUCTS MANUFACTURER

ROCKLEDGE PRODUCTS COMPANY
PHONE 342-J
PORTLAND. INDIANA

BRICK BLOCKS DRAIN TILE — STAVE SILOS COAL POCKETS TANKS

August 27, 1940

W. E. Dunn Mfg. Co.,
Holland, Michigan,

Gentlemen:

You perhaps are quite well acquainted with the extensive line of cement products we manufacture.

We quite frequently make a thorough check to determine what line gives the most all round satisfaction, from the standpoint of manufacturing, public acceptance, and last, but not least, net profit.

We find in the operation of the various machines for producing concrete units, the variation of the human element controls the output, and of course regulates production and ultimately governs the profit.

Our several checks have always brought us around to brick, made on your brick machine.

The automatic principle of feeding, palleting, and the straight line production principle, reduces the human element to a known quantity, we know absolutely what a brick or a dozen brick cost, and we don't mind telling you that our costs are low enough that we are able to compete with any brick on the market, insure ourselves a ligitimate profit and give the customer a better brick.

Pardon the commercial, but it is the bald-headed truth.

We are yours respectfully,

Wm R Smith
ROCKLEDGE PRODUCTS CO.

# PIT AND QUARRY

## *Research Department*

### 538 South Clark St., Chicago, Ill.

*Please send me catalogs and prices concerning the following items checked below:*

- ☐ Agitators, sand and Gravel
- ☐ Agitators, Slurry
- ☐ Aggregate — Bituminizing Plants
- ☐ Air cleaners
- ☐ Air compressors
- ☐ Asphalt Mixing Plants
- ☐ Asphalt Mixers
- ☐ Bag filling and weighing machinery
- ☐ Bags, cloth
- ☐ Bags, paper
- ☐ Balls, steel
- ☐ Barges, steel
- ☐ Batcher Plants
- ☐ Belt Dressing
- ☐ Belt fasteners
- ☐ Belting, conveyor and elevator
- ☐ Belting, transmission
- ☐ Belt lacing
- ☐ Belt plates
- ☐ Belt rivets
- ☐ Belt tighteners
- ☐ Bin gates
- ☐ Bins, concrete
- ☐ Bins, steel
- ☐ Blasting supplies
- ☐ Blasting powder
- ☐ Blocks, friction
- ☐ Boats, self-unloading
- ☐ Bodies, Motor Trucks
- ☐ Brake Linings
- ☐ Buckets, Clamshell
- ☐ Buckets, Conveyor and Elevator
- ☐ Buckets, Dragline
- ☐ Buckets, Orange Peel
- ☐ Cableways, Slackline
- ☐ Calcining Machinery
- ☐ Car Dumpers
- ☐ Car Pullers and Movers
- ☐ Carriers, Belt
- ☐ Cars, Dump
- ☐ Cars, Kiln
- ☐ Castings, Manganese Steel
- ☐ Castings, Steel
- ☐ Chains, Conveyor and Elevator
- ☐ Chains, Power Shovel, Crane and Dredge
- ☐ Chains, Transmission
- ☐ Chutes
- ☐ Classifiers
- ☐ Clips, Wire Rope
- ☐ Clutches
- ☐ Clutches, Magnetic
- ☐ Concrete Plants, Ready Mixed
- ☐ Cones, Washing
- ☐ Conveyors, Apron
- ☐ Conveyors, Belt
- ☐ Conveyors, Pneumatic
- ☐ Conveyors, Screw
- ☐ Conveyors, Skip
- ☐ Coolers
- ☐ Couplings, Flexible
- ☐ Couplings, Hose
- ☐ Cranes, Locomotive
- ☐ Cranes, Overhead Traveling
- ☐ Cranes, Truck
- ☐ Crushers, Cone
- ☐ Crushers, Disc
- ☐ Crushers, Gyratory
- ☐ Crushers, Hammer
- ☐ Crushers, Jaw
- ☐ Crushers, Ring
- ☐ Crushers, Roll
- ☐ Crushers, Rotary
- ☐ Cutter Heads, Dredging
- ☐ Derricks
- ☐ Draglines, Cableway
- ☐ Draglines, Revolving Boom
- ☐ Dredges, Dipper
- ☐ Dredges, Hydraulic
- ☐ Dredges, Ladder
- ☐ Drill Sharpening Machinery
- ☐ Drills, blast hole
- ☐ Drills, Diamond Core
- ☐ Drills, Hand Hammer
- ☐ Dryers, Rotary
- ☐ Dryers, Sand and Gravel
- ☐ Dust Collecting Systems
- ☐ Dynamite
- ☐ Elevators, Bucket
- ☐ Engines, Diesel
- ☐ Engines, Gas
- ☐ Engines, Gasoline
- ☐ Engines, Hoisting
- ☐ Engines, Oil
- ☐ Feeders
- ☐ Filters, Air
- ☐ Filters, Oil
- ☐ Fire Brick
- ☐ Flanges, Pipe
- ☐ Frogs and Switches
- ☐ Fuses, Blasting
- ☐ Gears
- ☐ Goggles
- ☐ Governors
- ☐ Grinding Balls
- ☐ Grizzlies
- ☐ Guns, Hydraulic
- ☐ Hoists, Air
- ☐ Hoists, Derrick
- ☐ Hoists, Drum
- ☐ Hoists, Motor Truck Body
- ☐ Hoists, Skip
- ☐ Hose, Air, Stream, Water
- ☐ Hose, Sand Suction
- ☐ Hydrators
- ☐ Kettles, Calcining
- ☐ Kilns, Rotary
- ☐ Kilns, Vertical
- ☐ Lime Putty Plants
- ☐ Linings, Kiln
- ☐ Loaders, Portable
- ☐ Loaders and Unloaders Box Car
- ☐ Locomotives, Diesel
- ☐ Locomotives, Gasoline
- ☐ Locomotives, Steam
- ☐ Log Washers
- ☐ Lubricants
- ☐ Measuring Devices
- ☐ Mills, Compartment
- ☐ Mills, Tube
- ☐ Mixers, Plaster
- ☐ Motors, Electric
- ☐ Motors, Gasoline
- ☐ Motor Trucks
- ☐ Motor Trucks, Ready-Mixed Concrete
- ☐ Nozzles, Hydraulic Mining
- ☐ Nozzles, Gravel Washing
- ☐ Nozzles, Spray
- ☐ Nozzles, Dust Settling
- ☐ Nozzles, Suction Hose
- ☐ Nuggets, Grinding Perforated Metal
- ☐ Poidometers
- ☐ Pulleys, Clutch
- ☐ Pulleys, Magnetic
- ☐ Pulverized Fuel Systems
- ☐ Pulverizers, Ball, Conical Pebble
- ☐ Pulverizers, Disc
- ☐ Pulverizers, Hammer
- ☐ Pulverizers, Ring
- ☐ Pulverizers, Rod
- ☐ Pulverizers, Roll
- ☐ Pumps, Centrifugal
- ☐ Pumps, Deep Well
- ☐ Pumps, Sand and Gravel
- ☐ Pumps, Slurry
- ☐ Pumps, Steam
- ☐ Radiators, Engine Cooling
- ☐ Rails
- ☐ Refractories
- ☐ Respirators
- ☐ Rollers, Conveyor
- ☐ Rolls, Crushing
- ☐ Rope, Wire
- ☐ Safety Appliances
- ☐ Sand-Lime-Brick Machinery
- ☐ Scales, Track
- ☐ Scales, Truck
- ☐ Scrapers, Dragline
- ☐ Screens, Revolving
- ☐ Screens, Shaking
- ☐ Screens, Vibrating
- ☐ Separators, Air
- ☐ Separators, Dry Centrifugal
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- ☐ Speed Reducers and Gears
- ☐ Spray Nozzles
- ☐ Sprays, Paint
- ☐ Sprockets
- ☐ Steel, Tool
- ☐ Stokers
- ☐ Switches, Track
- ☐ Tanks, Concrete and Steel
- ☐ Tanks, Sand Settling
- ☐ Tanks, Wood
- ☐ Thickeners, Slurry
- ☐ Track, Portable
- ☐ Track Shifters
- ☐ Tractors, Crawler
- ☐ Tramways, Aerial
- ☐ Trippers, Belt
- ☐ Trippers, Tramway
- ☐ Unloaders
- ☐ Valves, Pump
- ☐ Washers and Scrubbers, Sand, Gravel, Stone
- ☐ Weighers, Automatic
- ☐ Welding Supplies
- ☐ Wheels, Car
- ☐ Winches
- ☐ Wire Cloth
- ☐ Wire Cloth, Manganese Steel

*To be used for* .....

*Firm Name* ..... *Individual* .....

*Address* ..... *City* ..... *State* .....

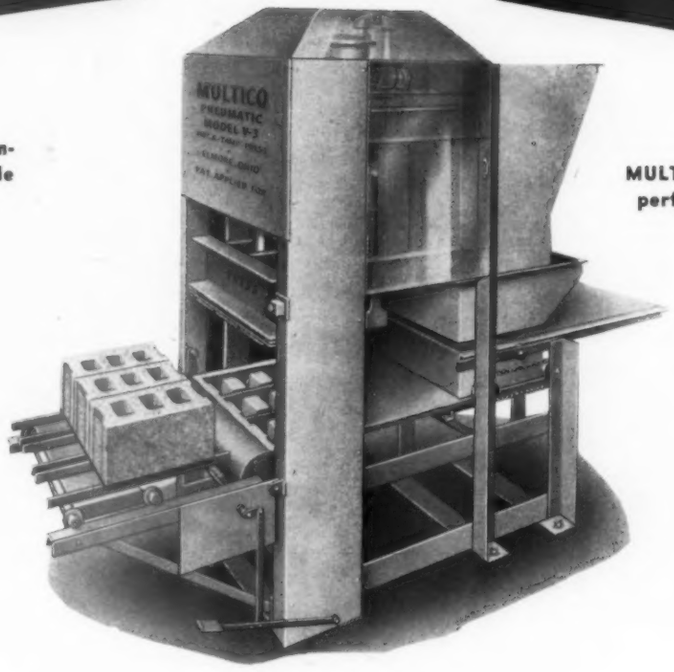
The CONCRETE MANUFACTURER

# MULTICO

## —A Sensational SUCCESS

Employs VIBRATING TAMPING PRESSURE

Vibration by COMPRESSED AIR OR ELECTRIC POWER




**Tamping and Vibration instantly adjustable over a wide range**

**MULTICO produces up to 9 perfect blocks per minute**

**POWER TAMPERS**
**HAND MACHINES**
**POWER MIXERS**
**FLUE BLOCK MACHINES**
**POWER PRESSES**
**HAND PRESS STRIPPER**
***Complete Product Plants Installed***

Profit-wise producers crowded around the MULTIPLEX booth during the recent Concrete Industries Convention at Chicago. They marveled at the many unique features that made the new MULTICO the star performer in the show.

They saw a revolutionary machine that uses vibration, tamping and pressure to produce units of uniform density and texture from any kind of aggregate. The whole operating cycle is push-button controlled, and runs on compressed air. Vibration is by either compressed air or electric power. Since the operation is automatic, many cams, gears and other parts are eliminated, insuring a long working life and minimum maintenance costs.

**Write TODAY for our big BULLETIN which gives full details about the MULTIPLEX "Equipment-for-Profit"**

## THE MULTIPLEX CONCRETE MACHINERY CO.

**ELMORE, OHIO**

Spickelmier Fuel & Supply Co., Indianapolis, Ind., operate one of the most successful concrete products plants in the Middle West. They bought a Stearns Joltcrete machine in February, 1938—installed a second Joltcrete in November, 1938 (—and have now installed a third!) They state publicly—

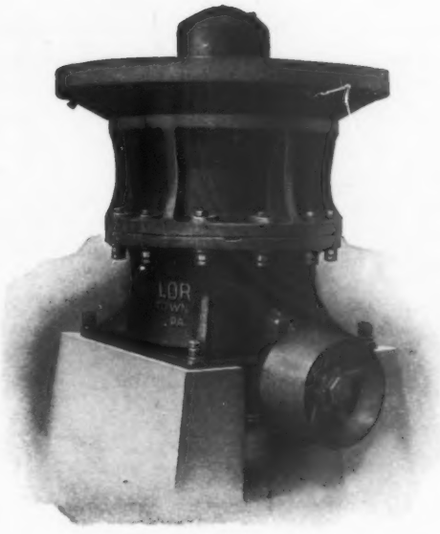
"We bought Joltcretes because this is the only high production machine we know of permitting the use of cored pallets,* which we insist upon."

All methods of vibrating concrete are not the same. Remember—Stearns Joltcrete vibration is the **only** type of vibration whose value was demonstrated by the impartial Wisconsin tests.

* Write to Stearns at Adrian for Bulletin "The Use of Cored Pallets."

**Over 100 Stearns Joltcretes in operation—**
**21 plants have bought their *second* Joltcrete!**

**STEARNS**
MANUFACTURING CO. - ADRIAN, MICH.
GENE OLSEN, PRESIDENT



# the TRAYLOR TYPE TY REDUCTION CRUSHER

## continues and increases its leadership!

In a single week, recently, SEVEN DIFFERENT OPERATORS purchased Traylor Type TY Reduction Crushers. Every success has a reason, and in the case of the TY, it is that the machine does what its owners expect, when they need it, with no trouble, at minimum expense. It achieves these objectives because of its superiority of construction and its ease of operation.

The Traylor Type TY Reduction Crusher is a feature machine throughout. Strength to spare, simplicity of design, scientific lubrication, positive protection against dirt and against damage by tramp iron, non-chokable Bell Heads and Curved Concaves—all of these elements combine to produce this hard-working, trouble-free and economical crusher that so well fills the needs of hundreds of operators.

INVESTIGATE OUR TYPE H BLAKE CRUSHER (BULLETIN 1105), AND OUR MULTI-STAGE FINE REDUCTION CRUSHER—(BULLETIN 113).

**SEE BULLETIN 2112**

# TRAYLOR

## ENGINEERING & MANUFACTURING CO.

MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

**NEW YORK CITY** 3916 Empire State Bldg.
**CHICAGO** 815 One La Salle St. Bldg.
**SALT LAKE CITY** 101 West Second South St.
**LOS ANGELES** 919 Chester Williams Bldg.
**SEATTLE** 6311-2nd Ave. N. E.

**B. C. EQUIPMENT CO., LTD.** 551 Howe St., Vancouver, B. C.
**MANILA MACH. & SUPPLY CO., INC.** Manila and Baguio, P. I.
**MAQUINARIA INTERNACIONAL, S. R. L.** Av. Francisco I. Madero No. 17, Desp. 214, Mexico, D. F.

**Export Department—104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Sao Paulo, Rio de Janeiro, Buenos Aires, Santiago, Valparaiso, Antofagasta, Oruro**

# LIMA

## IS "RIGHT AT HOME" IN HARD DIGGING

Stripped of all unnecessary weight by the use of modern steels, plus the latest mechanical features in excavator design, LIMA shovels, draglines, and cranes are constantly establishing new records for big production and low cost operation. LIMA excavators are modern throughout and are qualified to meet the toughest kind of assignments. Sizes range from ¾ yard to 3½ yards capacity. For your next shovel, dragline, or crane, it will pay you to investigate LIMA.

**LIMA LOCOMOTIVE WORKS, INCORPORATED**

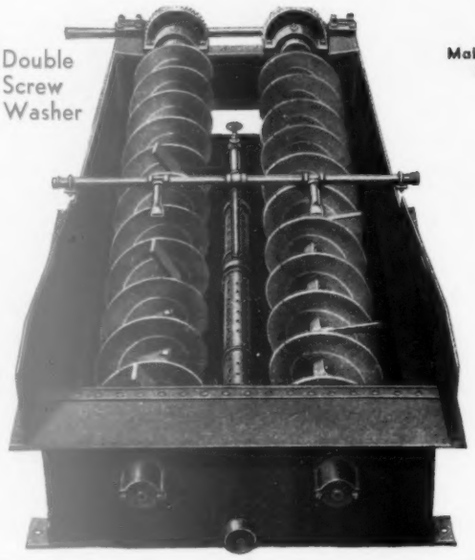
**Shovel and Crane Division** **LIMA, OHIO**

NEWARK, N. J. NEW YORK, N. Y. MEMPHIS, TENN.
LOS ANGELES, CALIF. SAN FRANCISCO, CALIF. PORTLAND, ORE.
DALLAS, TEXAS SEATTLE, WASH. SPOKANE, WASH.
CHICAGO, ILL. MINNEAPOLIS, MINN.

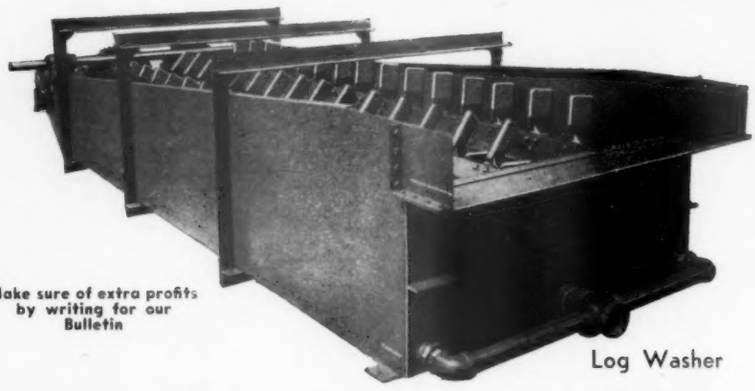
# EAGLE SAND and GRAVEL WASHERS Really Clean Up on the Job

EAGLE Washers have set the pace for many years in the sand and gravel industry. They are designed and constructed to do a quality job. Exclusive and patented features insure record operating economies, as attested by producers throughout the United States.

EAGLE Spiral Screw Washers are recommended for all material of lighter specific gravity than the aggregate. Furnished with single or double screw, and various diameters.



Double Screw Washer



Log Washer

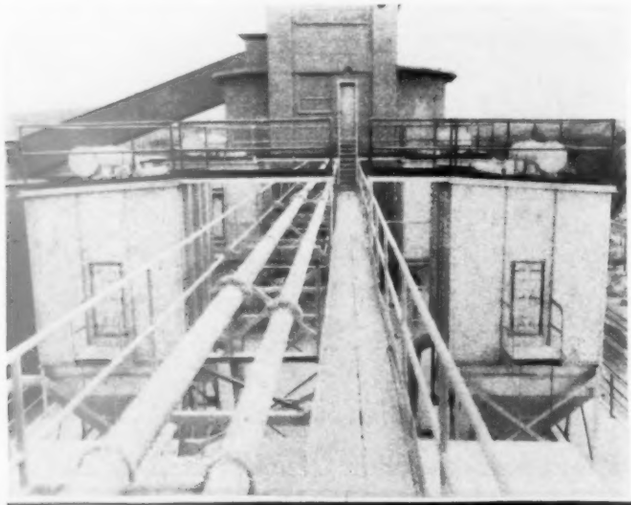
**Make sure of extra profits by writing for our Bulletin**

Frequently washing problems are encountered where there is difficulty in breaking down refractory materials such as tough clays or conglomerates. EAGLE Paddle type Log Washers of proper length give complete satisfaction in handling aggregates of this description. They have also been used extensively in washing various ores.

Standard machine is Double Log type. We will quote on single log machine on application.

EAGLE Products have enjoyed an enviable—and deserved—reputation since 1872. They include: EAGLE Double Roll Crusher, Shale Planer, Sand Drag, Sand Tank, Dry and Wet Pans, Specialized Mining Equipment, Olsen Self-Dumping Cages, and the famous ***Swintek*** Chain Type Screen Nozzle Cutter which has revolutionized dredging operations.
An investigation of EAGLE equipment will cost you nothing—and assure better operating profits.

**EAGLE IRON WORKS** Des Moines, Ia.



**NORBLO DUST COLLECTING SYSTEMS**
FOR
ALL DEPARTMENTS IN CEMENT
AND
CRUSHED STONE PLANTS

**NORBLO EXHAUST FANS AND BLOWERS**

*Write for Bulletins*

**THE NORTHERN BLOWER COMPANY**
West 65th St. and Denison Ave., Cleveland, Ohio

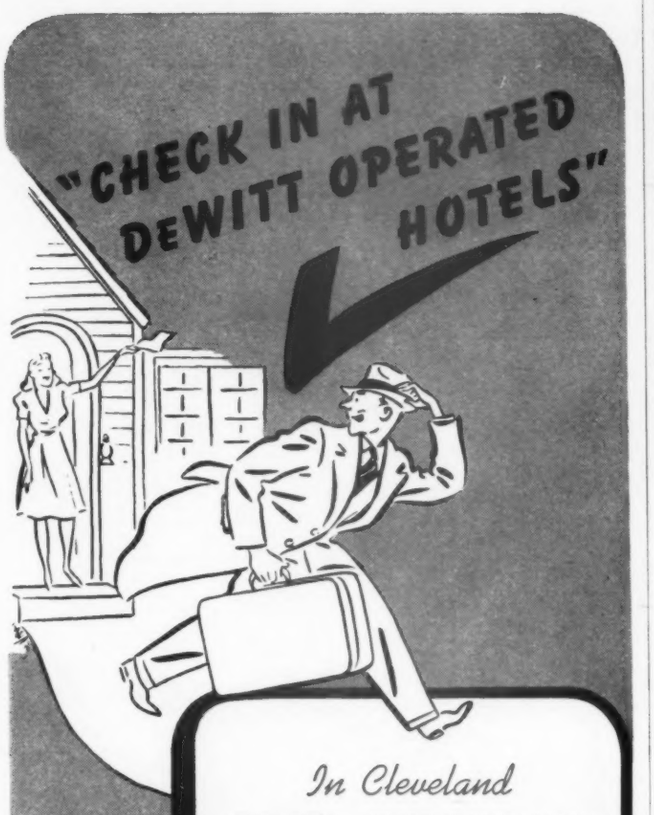
**MANGANAL**
(REGISTERED U. S. PATENT OFFICE)

## SAVE . . . . . by Welding

Pit, quarry and plant equipment . . . crushers, shovel and dipper teeth, crawler treads, pump parts, etc. . . . can be saved, made better than new again and at insignificant cost, the MANGANAL WAY. More than 100 distributors (one of them is near you) carry MANGANAL 11 to 13½% Manganese Nickel Steel Welding electrodes, applicator and wedge bars, and SEACO Hard-Surfacing Electrodes. Write for complete details about this modern, money and time-saving way to keep your equipment in tip-top operating condition at low cost.

**STULZ-SICKLES CO.**
Sole Producers Newark, N. J.

**MANGANAL**




*In Cleveland*
**HOTEL HOLLENDEN**
•
*In Columbus*
**THE NEIL HOUSE**
•
*In Akron*
**THE MAYFLOWER**
•
*In Lancaster, O.*
**HOTEL LANCASTER**
•
*In Corning, N. Y.*
**BARON STEUBEN HOTEL**

DeWITT OPERATED HOTELS

THE HOTELS THAT CHECK WITH EVERY TRAVEL STANDARD

THEODORE DeWITT, President
R. F. MARSH, V. P. & Gen. Mgr.

CP

"PACKAGE TYPE"
**STATIONARY COMPRESSOR**

Requiring minimum floor space and an inexpensive foundation... shipped intact and easily installed, CP's Type "Y" Double-Acting Compressor is a heavy-duty, economical unit. Available in capacities of 300 to 900 c.f.m. at 80-125 lbs. pressure, with built-in motor, belt wheel or coupling. Write for Bulletin No. 766.

**CHICAGO PNEUMATIC TOOL COMPANY**
*General Offices:* 6 EAST 44th STREET, NEW YORK, N. Y.
Sales Offices and Service Stations Throughout the World

CP **STATIONARY AND PORTABLE COMPRESSORS**

MEANS

# *LESS WEAR!*

Even the most confirmed skeptic must admit that when two surfaces do not touch there can be no wear. That is why LUBRIPLATE Lubricants impart indefinite life to shafts, bearings and gears. LUBRIPLATE has qualities not possessed by conventional lubricants. Its separating film is tougher, able to sustain greater loads, more water resisting, steam resisting and completely resists rust and corrosion. Extremely economical . . . it lasts longer. Cleaner . . . most LUBRIPLATE products are white in color.

**YOU TRY IT.** Let LUBRIPLATE prove itself at our expense on the job that is giving you the most trouble. There is a LUBRIPLATE field engineer near you. He will gladly call and will give you a trial quantity of the proper type of LUBRIPLATE. The results will prove that LUBRIPLATE is the most effective and efficient lubricant you have ever used. Write for the special bulletin "LUBRIPLATE In Aggregates Industry."

**LUBRIPLATE DIVISION**
**FISKE BROTHERS REFINING CO.**
NEWARK, N. J. TOLEDO, OHIO
*DEALERS FROM COAST TO COAST*

**LUBRIPLATE**
THE MODERN LUBRICANT
THAT ARRESTS PROGRESSIVE WEAR

# NAYLOR LIGHT-WEIGHT PIPE
## MAKES LIGHT WORK OF DREDGING OPERATIONS!

Here's the pipe for dredging operations that combines the economies of light weight with structural strength, leak-tightness and safety not found in any other light weight pipe.

Experienced sand and gravel operators know that Naylor's exclusive Lockseam Spiralweld enables this pipe to carry loads usually requiring heavier wall pipe. High pressure or low pressure service—Naylor Pipe is built to take it, with a safety feature in the lock-seam construction that provides a continuous expansion joint throughout the line.

This versatile service plus the savings in transportation and handling provide the solution to your dredging problems. Sizes from 4" to 30" in diameter. Special connections and fittings for dredging service.

**Write for Naylor advantages or send specifications for quotation.**

**NAYLOR PIPE COMPANY**
**1257 EAST NINETY-SECOND STREET**
**CHICAGO, ILLINOIS**

**NAYLOR LOCKSEAM SPIRALWELD PIPE**

# Uniform Separation

The new model GAYCO Centrifugal air separator makes possible the uniform and increased recovery of cement and other extremely fine materials within a range of 60 to 400 mesh.

- Greater Capacity
- Cleaner Tailings
- 99% Through 325 Mesh
- 25% to 30% greater recovery of fines.
- Not affected by variation in speed or rate of feed.

Manufacturers also of "Reliance" Crushers, Screens, Elevators, Conveyors, Bin Gates, Grizzlies. Complete crushing, screening and washing plants for crushed stone, sand and gravel.

## UNIVERSAL ROAD MACH'Y CO.

Rubert M. Gay Division 117 Liberty St. New York, N. Y.
Canadian Representative: F. H. Hopkins & Co., Ltd., Montreal

# CUTS COSTS!

Ohio gravel firm separates sandfrom gravel right at diggings with a

## LINK-BELT VIBRATING SCREEN

• The Massillon Washed Gravel Co., Navarre, Ohio, has found how to cut costs with a Link-Belt vibrating screen. By setting up a plant right at the diggings with a vibrating screen for separating the sand from the gravel, they have reduced the cost of transporting to the main plant —a mile away—where the gravel is graded. For two years this Link-Belt Screen has been giving great service. Operating 12 hours a day, it handles 100 tons of sand and gravel every hour with practically no maintenance expense. If you have a screening problem—write for complete information on Link-Belt vibrating screens. Ask for Book PQ-1792.

**LINK-BELT COMPANY**

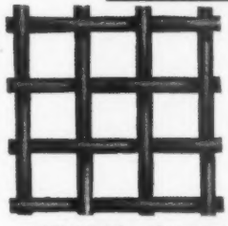
Philadelphia, Chicago, Indianapolis, Atlanta, Dallas, San Francisco, Toronto. Offices and warehouses located in principal cities. 8271

**LINK-BELT** *Vibrating* **SCREENS**

## STEADY PRODUCTION

REQUIRES

**DEPENDABLE WIRE SCREEN!**



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**"T.C." ALLOY SCREENS**

On your equipment NOW will insure continuous operation for months to come.

**TWIN CITY IRON & WIRE CO.**

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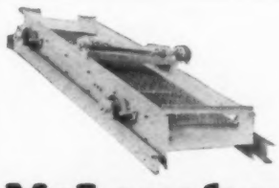
*Write for Catalog No. 39*



## McLanahan Equipment

Single and double roll and jaw crushers, hammer mills, super dry pans, — steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists, — complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

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you'll be thankful if your materials are being entrusted to Davenport Locomotives. Built to last, designed with the latest features, Davenports give you everything you want in Dependability and Economy—your BEST BUY —backed by more than forty years of proven merit.

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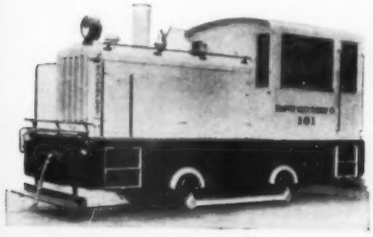


## DAVENPORT LOCOMOTIVE WORKS

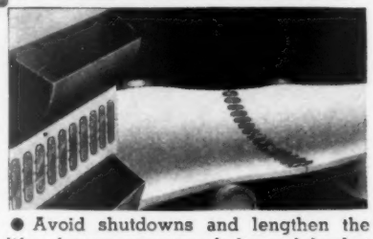
A DIVISION OF DAVENPORT BESLER CORPORATION, DAVENPORT, IOWA

## Keep your conveyor belts going with

**FLEXCO**

**HD BELT FASTENERS**

• FLEXCO H D RIP PLATES are used in repairing rips and patching conveyor belts. The wide space between outer bolts gives the fastener a long grip on the edges of the rip, while the center bolt prevents the fasteners from bulging.



• Avoid shutdowns and lengthen the life of your conveyor belts and bucket elevator belts by using Flexco HD belt fasteners and rip plates. Thousands of companies have stepped up the performance of conveyor lines and cut costs by using Flexco methods.

• FLEXCO H D BELT FASTENERS make a strong, tight butt joint with long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Six sizes in steel and alloys.

Bulletin F-100 shows exactly how to make tight butt joints in conveyor belts with Flexco HD Belt Fasteners. Also illustrates step by step the latest practice in repairing rips and putting in patches.

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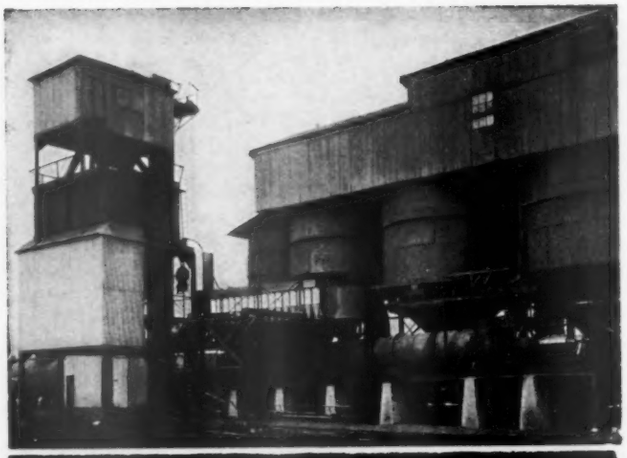
4623 Lexington St., Chicago

**FLEXCO HD BELT FASTENERS**
Sold by supply houses everywhere



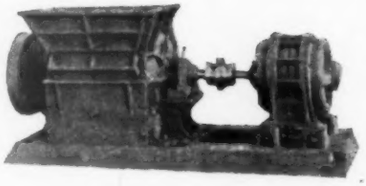
WARREN ASPHALT PLANTS
HOT MIX — COLD MIX
— OR —
COMBINATION UNIT FOR BOTH TYPES
CAPACITY DESIGN AND ARRANGEMENT TO MEET ANY REQUIREMENTS

Designed and Built
— By —
WARREN BROTHERS ROADS CO.
38 MEMORIAL DRIVE
Cambridge Massachusetts

*100% Reliability with*

# AMERICAN

*Crushers and Pulverizers*



Let AMERICAN provide the solution to your reduction problems as it has done satisfactorily for hundreds of other pit-and-quarry operators. AMERICAN Crushers, Hammermills and Ringmills are 100% reliable because of their extra-rugged construction which assures long, trouble-free service. High-test cast iron, special steels and long-wearing abrasion-resisting manganese steel are combined to provide a machine you'll "brag" about after you've used it. Capacities from 10 to 100 tons per hour. Get all the facts quickly!

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Refer to the listings in the Broadcast Section in this issue for a wide variety of used and surplus machinery and supplies.

# NEW EQUIPMENT means LOWER COST DIGGING!

1500 Rolled Alloy Steel EXCAVATORS HAVE CONCLUSIVELY PROVED THAT P&H'S MODERN DESIGN IS FAR AHEAD — Superior

Why cling to that old shovel? Why rob your profits to pay repair bills? The exclusive rolled alloy steel construction of P&H excavators means more dependability, greater production—and extra strength to resist the wear and tear of year-after-year operation.

Ask also about P&H's new hydraulic control. It's simpler, more positive and as smooth as steam!

*Capacities from 3/8 to 5 cu. yds. Gasoline, Diesel, electric power. Literature available on all models.*

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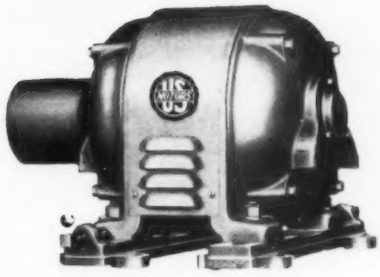

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## COLUMBIA CONSTRUCTION CO.

equipped with

# U. S. MOTORS

(Total, 2000 horse-power)

U. S. Uniclosed Motors
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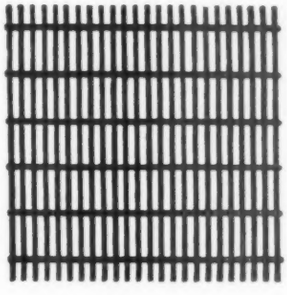

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A super wearing Steel developed to resist the abrasion and vibration of modern screening demands.

"CLEVELAND" SCREENS

A wire cloth of guaranteed accuracy backed by fine workmanship and an effort to satisfy.

Available in Square Mesh and Rolled Slot. A trial will convince you of the superiority.

2 Mesh .162 Ga.

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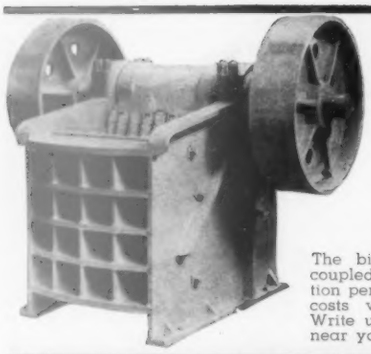
# INDUSTRIAL BROWNHOIST BUCKETS

**STEP-UP PRODUCTION · HELP CUT HANDLING COSTS**

Built in rope-reeve, power-wheel, lever-arm and link types, there is an Industrial Brownhoist clamshell bucket designed to best meet your specific handling needs. Durable, strong and easy to operate. Note how the rope-reeve bucket illustrated takes a full bite in the handling of red clay. Capacities from 1/2 to 15 yds. Write for catalog 353.

**INDUSTRIAL BROWNHOIST** BAY CITY, MICHIGAN · DISTRICT OFFICES: NEW YORK, PHILADELPHIA, PITTSBURGH, CLEVELAND, CHICAGO



**24 x 36**
**HEAVY DUTY**
**DIAMOND**

- Large Capacity
- Wide Range of Sizes
- Full Roller Bearing
- Long jaw Pitman
- All steel construction

The big capacity for size rating coupled with low power consumption per ton and small maintenance costs warrant your investigation. Write us today. There is a dealer near you to serve you.

DIAMOND IRON WORKS INC.
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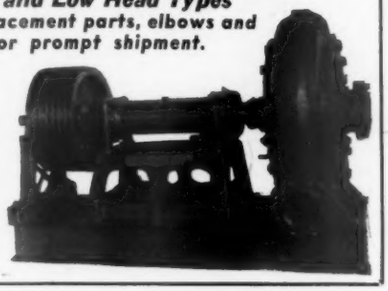
**LIGHTNING**
***Sand and Gravel Pumps***
***Heavy-Duty (Ball-Bearing) and Low Head Types***
***Complete stock of replacement parts, elbows and fittings carried for prompt shipment.***



Also clear water pumps for general service, modern design, lowest cost. High efficiency means low operating costs. Replacement parts always fit. We build abrasive material, handling pumps from 10" down to 3" in size.

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**KANSAS CITY, MO.**

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**THAT WILL SAVE YOU TIME AND MONEY**
**MAMMOTH**
LIMESTONE CARRIER & SPREADER
Manufactured by **BAUGHMAN MFG. CO., Jerseyville, Illinois**

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**Performance-Tested**

BUCKET ELEVATORS
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for cement, lime, ores, etc.

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***COMPLETE CONVEYOR SYSTEMS ENGINEERED TO YOUR NEEDS*** Sprout-Waldron engineers will want to know the nature of material to be moved, the distance involved, the capacity required. Their job is to give you most efficient performance at lowest cost. Talk to a Sprout-Waldron sales engineer. There's no obligation, and he may be able to save you money. *Literature on request.*

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*ELEVATORS, CONVEYORS, POWER TRANSMISSION EQUIPMENT*

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**PERFORATED PLATE**
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for maximum productiveness from your vibrating screens.
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600 ROOMS each with bath from $2.50 up

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### AIR COMPRESSORS

2—Sullivan 1573-cu. ft. displacement, 2 stg., cyl., size 22x13x14"; with intercooler, Class WM-31, direct connected to 250 HP 440-volt, 60 cy., 3 ph., A.C. Syn. Mtrs.

30—Portable gasoline driven air compressors all makes—sizes 310', 260', 220', 160', 110'.

### BINS

1—Blaw Knox 120-ton level capacity 4-compartment steel bin with extra 100 bbl. cement compartment, dial scale for weighing 1½ yd. batch, and separate dial scale for weighing bulk cement complete with Fairbanks-Morse water weighing device.

14—2 compartment bins: 3—118 ton Blaw Knox, 1—75 ton Butler V-40, 3—72 Blaw Knox, 1—60 ton V40, 1—51 ton Blaw Knox, 2—30 ton Johnson, 2—35 ton Blaw Knox Portable, 1—26 ton Heltzel Portable with chrome dial scales, above with or without weigh batchers.

### BUCKETS

26—Clamshell, all sizes and types; Williams, Blaw Knox, and Owen.

6—Dragline: 1—1⅜ yd. Northwest; 1—1½-yd. Omaha; 1—1¼ yd. Page; 2 1 yd. Hayward; 1—¾ yd. Page.

1—1½ yd. Pioneer Cableway Excavator bucket.

7—Dragscraper: 2—1 yd. Sauerman; 1—1 yd. Green; 1—¾ yd. Garst; 2—½ yd. Garst.

### CRANES, DRAGLINES & SHOVELS

1—Link-Belt, K-55, Serial No. 1698, 70' boom, 2 yd. bucket, also have 2 yd. shovel attachment.

### ROCK DRILLS

**With any style mounting, wagon, column or tripod.**

22—Ingersoll-Rand Models X71, Weight 220 lbs.; S-70, Wght. 185 lbs.; R72, Wght. 175 lbs. for 1⅛" steel.
10—Sullivan Models FG-3, Wght. 250 lbs. for 1½" steel; Mod. TJ-10, Wght. 161 lbs. for 1⅛" steel.
4—Gardner Denver Model 17, Wght. 180 lbs. for 1¼" steel.

### JACK HAMMERS

53—Jackhammers for 1" and ⅞" Steel—Ing. Rand Models S49, DCR23, Gardner Denver Mod. 37 and 11D. Also riveting and chipping hammers, Paving breakers, drills and reamers, grinders, etc.

1—Link-Belt K-48, Serial No. 1728 with 60' boom 2 yd.

1—Northwest Model 5, Serial No. 3572 with 50' boom, 1½ yd.; also pull shovel 1¼ yd. and

2—Northwest Model 4, Serial Nos. 3441, 3445 with 40' boom 1 yd.; also 1-yd. pull shovel.

1—Northwest Model 104, Serial No. 2079, 45' boom, 1¼ yd. bucket; with 1 yd. shovel attachment.

1—Industrial Brownhoist Model D.C., 15-ton cap. with 40' boom.

1—Link-Belt, Model K-42, Serial No. 1265, 45' boom, 1¼ yd. bucket, also 1 yd. trench hoe attachment or 1¼ yd. shovel front.

3—Northwest Model 105, Serial Nos. 2556, 2053, 1645, 40' boom, 1 yd. bucket with one shovel attachment.

1—Bucyrus-Erie Model 1035, Ser. No. 11034, 50' boom with 1 yd. bucket.

2—Osgood Heavy Duty, Serial No. 2069 and No. 2087, 40' boom, 1 yd. bucket and with 1 yd. shovel attachment.

1—Thew, ¾ yd. Gasoline Shovel with ¾ yd. shovel front and 40' crane boom. Serial No. 2801.

1—P&H, ¾ yd. Gasoline Crane with 40' boom. Serial No. 1834.

1—Koehring Model 301, Serial No. 544, 40' boom ¾ yd. bucket.

1—Northwest No. 2 crane, new 1937 with 40' boom.

1—Byers Bearcat Model 27, Serial No. 5289, 30' boom, ½ cl. sw., ½ yd. bucket.

1—Erie Steam Crane & Shovel with 40' crane boom, with or without ¾ yd. shovel front.

### CRUSHERS

5—Gyratory crushers: 1—No. 5 Allis-Chalmers; 1—No. 5 Austin; 1—No. 5 Gates; 1—No. 3 McCully; 1—No. 0 McCully.

10—Jaw Crushers: 3—15x36" Universal; 1—15x36" Cedar Rapids; 1—15x26" Champion; 1—12x20" Acme; 2—10x20" Climax No. 21½; 1—9x16' Telsmith No. 9A; 1—9x15" Champion.

1—Set of Allis-Chalmers, smooth type crushing rolls, 42x16".

### DREDGE PUMPS

1—12" Morris heavy duty D.C. to 100 H.P. double-single steam engine.

1—6" Morris direct connected to 40 H.P. elect. Motor.

4—belt driven; 4—Morris Manganese, 1—10", 1—8", 1—6", 1—Cataract cent. pump 8".

### DERRICKS

3—steel Guy Derricks; 1—15 ton Terry, 115 ft. mast, 100' boom, 1—10 ton American, 115' mast, 100' boom, 1—6 ton Bedford, 90' mast, 80' boom,

6—steel stiff leg; 1—25-ton just, 77' boom, 1—18 ton Double, 75' boom, 1—15 ton just, 65' boom, 1—15 ton Clyde, 50' boom, 1—10 ton Insley, 80' boom,

### HOISTS

1—2 Yd. Thomas 2 speed Class I, Cableway excavator hoist with 150 HP electric motor.

1—National 50 HP dragscraper hoist for handling 1 yd. bucket with 50 HP electric or gas power.

1—1 Yd. Cedar Rapids 2 speed dragscraper hoist with 50 HP electric or gas power.

1—1 Yd. Kern variable speed dragscraper hoist powered by 50 HP electric motor.

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**Bucket Elevators: Enclosed**—Continuous—Spaced, 24"x60', 20"x40', 16"x60' 14"x50' 14"x32' 12"x35', 10"x35', 8"x32', 5"x14',

**Crushers:** 4x10, 9x15, 9x16, 12x18, 12x20, and 24x36. Gyratorys—No. 25 Kennedy and 8" Traylor.

**Screens:** 12 Hummer Vibrating with V16 heads. 120 New Hummer Ton Can 3x5 and 4x5 Wire Mesh. 3x5' 1-deck Multirap Vibrating with washer. 3x8' 1-deck Link-Belt Vibrating, feed gate. 4x8' 2-deck Robins "Perfex" Shaking Types. 3'x16' and 4'x21' Revolving Types.

**Railway Equipment:**
1000' of 24"-g. Track, Curves and Switches.
12—24"-g. Atlas Cars, 1½-yd End Dump.
5—24"-g. Easton Cars, 1¼ yard V-shaped.
12—24-"-g. Koppel Cars, 1-yard V-shaped.
8—36"-g. Koppel Cars 3-yards V-shaped.
2—30"-g. Mercury Battery Locomotives, 45-V.
36"-g. Vulcan Gasoline Locomotive, 4-ton.
36"-g. Plymouth Gasoline Locomotive, 7-ton.
36"-g. Whitcom Gasoline Locomotive, 8-ton.

**Belt Conveyors:**
16"x20' Jeffrey and 18"x44' Portable Types.
Trough and Return Idlers for 12"—30" Belt.
150 Head and Tail Pulley Conveyor Assemblies.
100-ft. 30" Gravity Rolls, 10' sections.
300-ft. 30" Nearly New 5-ply rub. cov. Belt.
850-ft. 36" Nearly New 6-ply rub. cov. Belt.
Feeders—24"x7' Plate and 36" Apron Type.
2 Magnetic Belt Pulleys for 14" wide Belt.

**Other Equipment:**
Storage and Pressure Tanks.—Truck Scales.
Bin Gates—18x18, 16x16, 12x12 lever type.
Loomis Clipper Blast Hole Drill, gasoline.
1-yd. Ransome Mixer, with Waukesha engine.
Gasoline Engines—3, 7, 12, 25 and 50 hp.
Dragline Buckets—½, 1, 1½ yard capacity.
Clamshell Buckets—¾, 1, 1½ yard capacity.
10 Centrifugal Water Pumps, Gas and Electric.

**G. A. UNVERZAGT**
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# FOR SALE

65—50 ton All Steel Self Clearing Twin Hopper Cars
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13—16 cu. yd. Air Operated Side Dump Cars

Ohio Locomotive Crane equipped for magnet operation complete with magnet
1—22½ ton Model "D" with 45" magnet

1—30 ton Saddle Tank Switching Locomotive

*Available for immediate inspection. Quotations gladly furnished.*

**RAILWAY ACCESSORIES COMPANY**
CAREW TOWER CINCINNATI, OHIO

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1—185 HP Cooper-Bessemer oil engine.
1—185 HP Cooper-Bessemer, direct connected to AC generator.
1—180 HP, type Y, style VA, Fairbanks-Morse engine.
1—665 HP McIntosh-Seymour AC oil engine generator set.
1—450 HP Cooper-Bessemer AC oil engine generator set.

This is only a partial list.
Time payments can be arranged.

**FLETCHER SALES COMPANY**
835 Security Trust Bldg.
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## NEED DUMP CARS? FOR SALE—200

20 and 30-yard Capacity All-Steel
Clark, Magor, Koppel and Western
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All Priced to Move Quickly
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1—450 HP Cross Compound Steam Engine.
1—18"x42" Simple Corliss Engine.
150 HP Boilers HRT Complete.
125 HP Scotch Marine Boiler.
60 HP Scotch Marine Boiler.
180 HP F.M. 3 Cyl. Belted Diesel Engine.
65 and 90 ft. Boom Wiley Electric Whirleys.
125 HP Diesel with Generator.
23,000 Gal. 10'x6"x30' Storage Tank.
10,000 Gal. 7' x30' Storage Tank.
10,000 Gal. 5' x40' Storage Tank.
Other Tanks, Boilers, Cranes, Shovels.
All Kinds of Equipment.

**THE T. J. LANE CO.**
Springfield, Ohio

## Rebuilt Equipment

BALDWIN 58 ton 6 wheel switcher, 19x24" cyl. Walscheart valve gear.
DAVENPORT 22 ton 4-wheel Saddle Tank; Cyl. 11x16.
P&H Model 330, ¾ Yd. Dragline.
PLYMOUTH 12 Ton 36" Ga. Gasoline Locomotive; Hand Brakes.
BROWNHOIST Model 4, 20 Ton 8-Wheel Locomotive Crane.
3 PLYMOUTH Model FL, 24" Ga. Gasoline Locomotive.
1 WHITCOMB Model CS-4, 4½ Ton, 24" Gauge Gasoline Locomotive.
P&H Model 206, ¾ Yd. Comb. Crane & Dragline; 38' Boom.
INDUSTRIAL Works 20-ton, 8 Wheel Loco. Crane. 50' Boom.
KOEHRING Model No. 1, ¾ Yard Comb. Shovel, Crane and Dragline.
LORAIN Model 75-B, 1½ Yard Gasoline Shovel.
BAY CITY Model S, 1 Yard, Gas Comb. Shovel and Crane. 40' Boom.

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**Plant & General Offices**
**Atlanta, Georgia**

## For Prompt Shipment Subject to Prior Sale

**GOOD USED CRUSHERS AND PULVERIZERS**

15x24 Blake Type Jaw Crusher

Model K Day Lime Pulverizer (3 ton hr.)

No. 7 Mitts & Merrill Wood Hog

Reconditioned CRUSHING PLANT includes, 15x36 Jaw and 30x18 Roll Crusher, Elevator, Screen, Bin, Power Units (will sell in separate units)

3—Portable LIMESTONE PULVERIZERS—6 to 7 ton per hour,—will handle 60 lb. Rock to Agricultural dust or 15 to 18 tons per hour road rock each.

**CRUSHER SERVICE**, Box 795, St. Louis, Mo.

## FOR SALE

1—¾ cu. yd. Sauerman Cable way dipping outfit complete (gasoline power)—Price $1100.00.
2—6 inch gravel pumps—Price $150. and $300.00.
1—Orton crane and dragline, 47 ft. boom, very good condition—Price $1850.00.
2—Bear Cat Cranes, combination hoe, skimmer and crane—Price $800.00 each.
2—Semi-trailers, flat bottom, one (1) 20 ft. $200.00; one (1) 27 ft. $350.00.
1—Cletrac 40 with power take-off—Price $300.00.
1—Portable gravel crushing plant, complete and in very good condition, $3000.00.
3—65 H.P. Waukesha power units—Price $300.00 each.
1—40 H.P. Waukesha power units—Price $200.00.
1—one (1) cu. yd. dragscraper outfit with 40 H.P. Waukesha Motor—Price $400.00.
1—Thomas ¾ yd. electric hoist—Price $800.00.
2—36 inch rotary screens with scrubber sections—Price $300.00 each.
1—No. 3 Gates Gyratory crusher—Price $450.00.
1—14 x 24 Roll crusher—Price $250.00.

**IRVING BROTHERS GRAVEL CO.**
**New Haven, Indiana**

## BARGAIN

1—Cedar Rapids crusher with revolving screen, mounted on hard rubber trucks.
1—Conveyor 45 ft. long, belt 24" with belt.
1—35 ft. conveyor 18" belt.
1—65 horse power engine.
1—10 yard steel hopper for trucks.

**Price $1250.00**

**LUHMAN GRAVEL COMPANY**
**Garden Prairie, Illinois**

## F-M DIESEL ENGINES

560, 460, 360, 240, 180, 80, 75, 50 HP.
2—150 HP. Buckeye, 4 cyl., "E"
1—600 HP. Burmeister & Wain.
1—190 HP. Buckeye, 2 cyl., "TH."
1—260 HP. Superior.
1—120 HP. Atlas.

**A. G. SCHOONMAKER**
42 Hudson St. Jersey City, N. J.
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## FOR SALE

1—Sullivan Class WJ Compressor 18"x11"x14", 568 cu. ft. per minute actual delivery at 100 pounds pressure. Belt Driven.

1—Used 24" Horizontal Symons Disc Crusher.

1—New 36" Horizontal Symons Disc Crusher.

1—Used Western Rotary Crusher, feed opening 9"x20".

The equipment is specially priced and available for immediate delivery.

Address:

**BOX 310**
**PIT AND QUARRY PUBLICATIONS**
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## CONVEYOR BELTING FOR SALE

42" wide Heavy Duty Conv. 130 ft.
36" wide Heavy Duty Conv. 175 ft.
12" wide Gyratory Crusher Belt, 8 PLY, 105 ft.
12" wide, BUCKET ELV. BELT, with 10" buckets attached, 70 ft.
Also other sizes priced way below market.

**Wanted: Conveyor Belting and Belt Conveyors All Sizes.**

**TERRENCE P. WYNN**
**55 West 42nd St. New York, N. Y.**

## FOR SALE

2—Allis-Chalmers
Gyratory Crushers
No. 8—No. 6

**M. S. ROSEN**
**G. P. O. Box 297 New York**
**Tel. Stillwell 4-3024**

Monighan 4-W Dragline. Bucyrus 37-B Dragline. Link-Belt 1½ yd. Shovel-Crane-Dragline, 60' bm. Koehring 702 Crane-Dragline, 70' boom, A-1. Cranes-Drags; NW 104-105-No. 3. Koehring 301-501. Lorain 1¼ yd. shovel. Also NW & P&H ¾ & 1 yd. Loco. Crane—20 ton, real buy. Others 10-35 ton. Drag Scraper & Slackline Excavators—½ to 4 yd. Bucket Loaders—Barber-Greene-Haiss-Link-Belt. Diesels—Cat. D13000, F-M 90 HP, Cummins 75, etc. Derrick Scow 1800 ton cap; Self unloading boat.

**JAMES WOOD, 53 W. Jackson Blvd., Chicago, Ill.**

## FOR SALE

Universal Portable Crushing Plant—18"x36" Roller Bearing Jaw, double deck Jigger screen, 36"x20" Double Roll, conveyors, 15-ton steel bin. Complete with two 100 H.P. IHC Diesel engines. First class, used little. 240 ft. Gardner-Denver Portable Compressor.

**GEORGE KENNEY**
**2136 Jefferson Street, Kansas City, Mo.**

*"The ad ran once—we sold the machinery. Please cancel future insertions."*

*Quoted from a letter written by a quarry operator who advertised equipment for sale in this Broadcast Section of Pit and Quarry.*

If you have something you want to sell, advertise it. If you want to sell it quickly, advertise it in Pit and Quarry.

Write for a rate card to-day, or, better still, send an advertisement and learn for yourself how well and quickly this section can serve you.

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ROAD AND AIRPORT EQUIPMENT

IMMEDIATE DELIVERY

3—3½ yard Rex separate engine drive mixers, 1936 mounted on dual pneu. Ward La France each..... **$2250**

1—3 yard Rex separate engine drive mixer 1934 mounted on dual pneu. A. C. Mack..... **$2000**

1—2 yard Jaeger separate engine drive mixer 1936—mounted on dual pneu. Ford V8-1937.. **$1950**

**all in excellent condition**

8 inch x 8 inch Road Forms

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Jaeger Lakewood Road finishers type G.

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**Cleveland Pioneer Trencher—**
**15 Cu. Ft. Orange Peel Bucket—**

**CleTrac Tractor Model A-30—**
**Jaeger Jiffy Mast—**
**5 Ton Buffalo Springfield 3 Wheel Roller—**

**Well Point Systems—Service From Coast to Coast. Other Bargains—in Pumps, Building Mixers, etc.**

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1—2½-Yd. Sauerman Dragline Cableway complete with 250 H.P. two speed hoist, two buckets, all cable, blocks, shackles. Used two months.

1—150 H.P. Two speed Thomas Hoist.

1—75 H.P. 2-drum Clyde Hoist. Can be used with either electric or gas power. Used for storing aggregates.

1—2-Yd. Crescent Scraper. Extra parts, chain, side teeth, digging teeth, roller bearing blocks, etc.

1—48" x 12' Heavy duty rotary screen.

1—Standard Eagle Washer, single screw.

3—45' to 47' Link-Belt Portable 24" Conveyor, steel frames, motor mounted in unit, complete with belt.

**CORNWALL SAND & STONE CORP.**
**R. R. 2, Newburgh, New York**

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**AIR COMPRESSORS**

1—Ingersoll-Rand 315 c.f. gasoline, 2-stage. Portable.

1—Ingersoll-Rand 210 c.f. gasoline, 2-stage. Portable.

**LOCOMOTIVES**

1—12-ton Davenport Standard gauge. Gasoline.

1—8-ton Vulcan. Standard gauge. Gasoline.

**CRANES**

1—Model 371 Marion Caterpillar Diesel. 2 yard capacity.

1—Industrial Brownhoist 15-ton Caterpillar. Gasoline.

1—Northwest Model No. 4 Gasoline. 15-ton with 100 ft. boom.

1—Little General. Gasoline Caterpillar. ½ yd. capacity.

**ATLANTIC EQUIPMENT CORP.**

50th and Grays Avenue
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## USED BARGAINS

12-Ton Plymouth Standard Gauge Locomotive.

2-Yard Sauerman Heavy Weight Scraper with No. 2500 Hoist.

Allis-Chalmers Model LO Tractor with 7-yard Scraper and Hydraulic Bulldozer.

*All in rebuilt condition.*

**H. B. FULLER EQUIPMENT CO.**
**1836 Euclid Ave. Cleveland, Ohio**

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**CRUSHERS—ELEVATORS—SCREENS**
**SAND WASHERS—PUMPS—CONVEYORS**

1—7½"x13" CHAMPION No. 3 Jaw Crusher.
3—BRAND NEW Jaw Crushers 9"x15" and 10"x20".
1—8"x15" CLIMAX No. 1½ Jaw Crusher.
1—9"x16" CLIMAX No. 2 Jaw Crusher.
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2—10"x16" NEW HOLLAND 4 roll crushers.
2—M-20 QUAKER CITY Hammer Mills.
1—No. 258 New Holland Swing Hammer Pulverizer, 6"x12" feed opening.
2—3'x5' LINK-BELT Vibrating Screens.
1—No. 1 STURTEVANT Open Door Rotary.
Cranes, Shovels, Hoists, Motors, etc. Sales & Service on UNIVERSAL CRUSHER CO. products.

**JOHNSON AND HOEHLER, INC.**
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**HAISS**

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**FACTORY REBUILT CLAMSHELL BUCKETS**

1—Blaw-Knox ¾ Yd. Lever Arm Bucket No. 613.
1—Haiss ¾ Yd. HiPower Digging Bucket with teeth.
1—Hayward 1⅝ Yd. Rehandling Bucket, weight 3600 lbs.
1—Hayward 1¼ Yd. Rehandling Bucket, weight 3200 lbs.
1—P&H Gas Engine Shovel, ¾ cu. yd. Used, good condition.

**FACTORY REBUILT TRUCK LOADER**

1—Haiss Model 27 Creeper Truck Loader, 3 Yds. per min.

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## ELECTRIC HOISTING ENGINES DOUBLE DRUM

1—Lambert with 30 HP 3 Phase Motor.

1—Lidgerwood with Independent operating winch heads. With 100 HP 3 Phase Motor.

1—Lidgerwood with Dual Safety Foot Brakes. With 100 HP 3 Phase Motor.

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**2829 Cedar Street Philadelphia, Pa.**

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Marion 300 steam dragline, 150' boom, 7 yd. bkt., truck type, good working cond. (West).
Bucyrus-Monighan 4W Diesel Walker dragline, 110' boom, 4½ yd. bkt. (South).
Allis-Chalmers No. 12 gyratory crusher, takes 33" rock, early model, but good condition.
American 55 ton steam Mogul 2-6-0 locomotive and tender, A-1.
Koehring 1 yd. 27E paving mixer, overhauled.
Diesel Engs., 275, 360, 550 HP, also generators.
Hydro-electric generating units, 300 to 2200 HP, 32' to 116' head.
Locomotives, gas, 7 to 20 tons, 30"-36" and 56½" gauges, Whitcomb and Milwaukee.
Bucyrus 80B steam high lift crawler shovel, 51' boom, 33' sticks, 2⅛ yd. dipper.
Marion steam dragline, 80' boom, 1½ yd. bkt., cable swing, skids and rollers (80.); $2,950.

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## FOR SALE

CRANES: Ohio model "E" 25 ton capacity steam locomotive crane, eight wheel double drums, 50' boom.

Industrial type "H" 25 ton capacity, steam locomotive crane eight wheel, double drums, 50' boom.

Smith 56-S Tilting Type Concrete Mixer, 2 cubic yard capacity, excellent condition.

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**RAILS "1 Ton or 1000"**

**NEW RAILS**—5000 tons—All Sections—All Sizes.
**RELAYING RAILS**—25,000 tons—All Sections—All Sizes, practically as good as New.
**ACCESSORIES**—Every Track Accessory carried in stock—Angle and Splice Bars, Bolts, Nuts, Frogs, Switches, Tie Plates.
**Buy from One Source—Save Time and Money.**
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**L. B. FOSTER COMPANY, Inc.**
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**COMPLETE STONE CRUSHING**
**or**
**SAND and GRAVEL PROCESSING SERVICES**
**available on tonnage basis**

We will install NEW, MODERN portable or semi-portable plant in any practical location. Capacities 100 to 150 tons of stone per hour or 150 to 200 tons of sand and gravel per hour.
**Estimates Furnished Without Obligation**

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## GUARANTEED REBUILT EQUIPMENT 50% SAVINGS

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| 350 HP | A.C. | | 2200 v. | 300 RPM | 100 HP | G.E. | 2200 v. | 1800 | RPM |
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| 300 HP | G.E. | 4000/ | 2200 v. | 514 RPM | 100 HP | G.E. | 440 v | 600 | RPM |
| 300 HP | Wtg. | | 2200 v. | 490 RPM | 100 HP | G.E. | 2300 v. | 900 | RPM |
| 200 HP | Wtg. | | 440 v. | 345 RPM | 75 HP | Wtg. | 220 v. | 690 | RPM |
| 150 HP | Wtg. | | 440 v. | 580 RPM | 50 HP | Wtg. | 2200 v. | 1160 | RPM |
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**200 Pumps all sizes, heads, kinds on hand. Also Compressors, Drives, Transformers. Chicago's Largest Stock.**

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**Chicago Electric Company, 1334 W. 22nd St., Chicago, Ill.**

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New and Reconditioned Machinery — Jaw Crushers — Rolls — Gears — Pinions — Elevator Cups — Spouting Pulleys — Boxes — Etc. Attractive prices.

**WEBB CITY & CARTERVILLE F & M WORKS**

**Webb City, Missouri**

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ON

RUBBER BELTING

Transmission—Conveyor—Elevator

"V" BELTS

FOR

Pumps—Crushers—Pulverizers—Etc.

RUBBER HOSE

FOR

AIR—WATER—STEAM—ETC.

Partial Stock List

## NEW AND HEAVY DUTY

Conveyor and Elevator Belting

| Quantity | Width | Ply | Type Cover | Bottom Cover | Type |
|---|---|---|---|---|---|
| 505 Ft. | 36" | 6 | 1/8" | 1/16" | Conveyor |
| 856 Ft. | 30" | 6 | 1/8" | 1/16" | Conveyor |
| 458 Ft. | 30" | 5 | 1/8" | 1/16" | Conveyor |
| 1905 Ft. | 24" | 5 | 1/8" | 1/32" | Conveyor |
| 250 Ft. | 24" | 6 | 1/16" | 1/16" | Elevator |
| 1298 Ft. | 24" | 4 | 1/8" | 1/32" | Conveyor |
| 250 Ft. | 22" | 8 | 1/16" | 1/16" | Elevator |
| 210 Ft. | 22" | 8 | Friction | | Elevator |
| 874 Ft. | 20" | 5 | 1/8" | 1/32" | Conveyor |
| 1765 Ft. | 18" | 4 | 1/8" | 1/32" | Conveyor |
| 750 Ft. | 16" | 4 | 1/8" | 1/32" | Conveyor |
| 1509 Ft. | 14" | 4 | 1/16" | 1/32" | Conveyor |
| 310 Ft. | 12" | 6 | Friction | | Elevator |
| 356 Ft. | 12" | 4 | 1/16" | 1/32" | Conveyor |
| 226 Ft. | 10" | 6 | 1/16" | 1/32" | Elevator |

We will cut any of above rolls. Advise desired lengths and widths and we will promptly quote prices. Many other sizes in stock for immediate shipment.

**CARLYLE RUBBER CO., Inc.**

62 Park Place New York, N.Y.

## SCRUBBING SCREEN FOR SALE

**30 Foot by 60 Inch Traylor.**

Complete for Belt Drive.

In Good Condition.

**SOUTHERN MATERIALS CORP.**

**NORFOLK VIRGINIA**

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### We Offer

1—Ohio, Type G, 35 Ton Steam Locomotive Crane, No. 3926 Bucket Operating.
1—American 30-Ton Locomotive Crane, 55' Boom.
1—Brownhoist 15-Ton Locomotive Crane. No. 8332.
1—Lorain 77—1½ Yd. Diesel Shovel—Dragline, No. 5570, new 1937.
1—Link-Belt K-44, 1½ Yd. Gas Crawler Crane.
1—Plymouth 18-Ton Standard Gauge, Gas Locomotive.

**SPECIAL**

23—C. P. No. 5 Drifters, Complete with Shells and Screws—$65.00 each.
Money Back Guarantee.

2—Plymouth 8 Ton, Standard Gauge Gas Locomotives.
1—Whitcomb 6 Ton, 24" Gauge Gas Locomotive.
1—Terry 25 Ton Steel Stiff Leg Derrick 3 line, 90' Boom.
1—Flory 10x12, 3-Drum Steam Hoist with Separate Swinger and Banked Levers.
1—Ingersoll-Rand XL 420' Actual Capacity Portable Compressor, Like New Cheap.
1—Chicago-Pneumatic 664' Diesel Compressor.
7—Hayward 1—1½—2 Yard Rehandling Buckets.

**Many Other Units. What Do You Need?**

**CHARLES DREIFUS**

**Widener Bldg., Philadelphia, Pa.**
**Rittenhouse 7750**

## LIQUIDATION SALE

2—Blaw-Knox Weighing boxes for 1 C.Y. batch.
1—Blaw-Knox 1 C.Y. clam shell bucket.
1—35 foot P&H Crane boom for 300 or 400 model.
1—¾ C.Y. Dragline bucket.
1—P&H Fairlead for 300 or 400 model.
2—I.R. Model 315 Compressors with Hesselman engine.
1—24 inch portable belt conveyor.
1—Nickerson stone spreader box.
1—Warco Road Grader on pneumatic tires.
1—Allis-Chalmers Model KO Tractor with bulldozer.
1—Single drum Hoist.
1—Model 10S Ransome Concrete Mixer.
1—Model 27E Ransome Paver.
7—Pumps from 2" to 4".
3—12 & 14-ton Buffalo-Springfield 3-wheel gas rollers.
1—P&H Model 650A 1¼ C.Y. Gas Shovel.
1—P&H Model 203A Truck Crane.
1—I.R. Jack Bit Grinder.
2—15-ton Truck Scales.
1—Superior Saw Table with 10" circular blade.
2—Hauck Tar Kettles, 50 gal.
20—I.R. and Cleveland Jack Hammers.
2—I.R. Tower Drills, Model X71.
1—I.R. Riveting Hammer.
10,000 feet road forms for 6", 8", and 9" pavement.
1—P&H Backhoe attachment for Model 300.
1—300 bbl. Blaw-Knox bulk cement plant, with Richardson electrically operated scale.
Also various other small items.
We prefer to sell in one block. Any reasonable offer will be considered. **Reply Box 13, Farmington, Conn.**

## FOR SALE

2½ Yd. Electric Slackline Cableway.
1 Yd. Electric Slackline Cableway.
1¼ Yd. Osgood Crane Gas Crawler.
1¼ Yd. P&H Shovel and Backhoe.
1 Yd. Link-Belt Crane.
1 Yd. Osgood Crane and Shovel.
½ Yd. General Crane and Shovel.
1 Yd. P&H Crane and Backhoe.
8 Ton Gas Std. Gauge Locomotive.
12 Ton Gas Std. Gauge Locomotive.
5 Ton Gas 36" Gauge Locomotive.
5 Ton Austin Gas Tandem Roller.
10 Ton Bflo-Spgfld. 3W Steam Roller.
No. 4 Gas Keystone Half Crawler 24" and 48" Ditchers & Skimmer Scoop Bucket.
6" Vertical Electric Submerged Pump.
4" Jaeger Sure Prime Gas Pump.
2½ ton 8" E. C. & B. Pipe Threading Machine.
150 Ton R.R. Track Scales.
Storage Tanks, Boilers, Motors, Power Units. All Kinds of Equipment.

**THE T. J. LANE CO.**

**Springfield, Ohio**

## SHOVELS—CRANES

1—Koehring Diesel Shovel 1¾ yd. Chain Crowd, new late 1936.
1—Osgood 1 yd. Gas Shovel cheap.
1—10-ton capacity Browning Electric Crane 40' Bm.
1—Universal Truck-Crane No. 1400 solid tires.
1—Northwest Backhoe attachment, first class.
1—30 Caterpillar Tractor-Bulldozer. A1 cond.

**GREY STEEL PRODUCTS CO., INC.**

**74 Central Ave. Glen Rock, N. J.**
**Tel. Ridgewood 6-2275**

## FOR SALE

**Crane**—Koehring 251, ¾ yd., 35'-45' boom.
**Hoists**—2 dr. and slewer, 35 HP; 2 dr., 25 HP.
**Derricks**—Steel guy, 40 and 50' bms., bull wheel; Stiff leg, 55' bm., bull wheel.
**Buckets**—Williams ¾ yd.; Blaw-Knox ½ yd.; Drag ¾ yd.; steel ½ yd. trip dump.
**Pile Driving**—Steel leads; 2400 lb. hmr.; caps for piles, wood and steel sheeting.
**Boiler**—Horizontal 20 HP, on steel skids.
**Pumps**—Centri., Diaph'm, Piston and Hose.
**Air Equipt.**—Compr. 45', Jack Hmr., Tamper.
**Blocks**—Hoisting, for manila and wire rope.

**LUNDGREN CONSTRUCTION CO.**

**405 51st St. Des Moines, Ia.**

## WANTED—Immediately Superintendent or Foreman

For Sand and Gravel Plant near Detroit, Michigan. Must be capable of taking complete charge of plant. Send complete details of experience to

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Marion 450 gas electric drag line machine equipped with drag line and clam shell buckets, 50 foot boom. Excellent condition. Late shop number. Priced to move.

**Send replies to**
**BOX 208**
**PIT AND QUARRY PUBLICATIONS**
**538 S. Clark St. Chicago, Ill.**

# Your IMPERATIVE NEEDS

## Can Be Met with the Consolidated BIG FOUR

### SOME SPECIAL ITEMS

1—30″ Allis-Chalmers Superior McCully Gyratory Crusher, also 20″ Traylor "Bulldog," 36″ Gates "N," 30″ Kennedy with motor.
2—10″ and 6″ Allis-Chalmers Superior McCully Reduction Crushers, with bell heads and new concaves.
1—8′x125′ Reeves Bros. Rotary Kiln.
2—8′x80′ and 6′x80′ Kilns, both Vulcan Iron Works. Excellent construction and in splendid condition.
1—5′x10′ Allis-Chalmers 2-deck Vibrating Screen, also 2—4′x8′ Stephens-Adamson, double deck.
3—8′x72″ Hardinge Conical Ball or Pebble Mills, also 8′x30″ iron lined, with 175 H.P. motor.
3—700 CFM Worthington Type V-6 Air Compressors, 100-lb. each twin unit with 200 H.P. 3/60/440 volt motor, direct connected both ends.
1—Lime Hydrator, Weber type, Arnold & Wiegle—with No. 1 Raymond Bros. Lime Separator.
1—5-roll Raymond low side Separator, with oil journals. Also one Raymond Single Whizzer for attaching to 4 or 5-roll mill.

**(1) Large Selection of Machinery in our Newark, N. J., Shops and from many other points in the U. S.**

**(2) Country-wide Coverage**

**(3) Experienced Staff**

**(4) Substantial Savings —Always**

**We have sold most of the equipment from the Castalia Portland Cement Plant in Castalia, Ohio, 60 miles from Cleveland. The following is still available for immediate shipment, at low prices:**

1—5′x10′ Bonnot Ball Mill, steel lining, peripheral discharge.
3—Rotary Kilns; 6′x120′, 6′x60′.
1—6′x60′ Direct Heat Rotary Dryer.
1—5′x22′ Bonnot Tube Mill, silex lined.
2—5′x27′ Tube Mills, silex lined, with 200 H.P. motors.
2—18 ton Steam Locomotives, Vulcan and Porter, 36″ ga.

Send for latest crushing "News" listing other sizes of Jaw, Gyratory and Roll Crushers; Gyratory Finishing Crushers, Shovels, Cranes and Draglines; Locomotives; Vibrating Screens; Elevators; Conveyors; Pulverizers; Ball, Tube and Rod Mills; Filters; Air Classifiers; Dorr Classifiers; Air Compressors, etc.

## CONSOLIDATED PRODUCTS CO., INC.

**17-19 PARK ROW** **NEW YORK, N. Y.**

***Our Shops at Newark, N. J., cover eight acres.***

## FOR SALE IMMEDIATE DELIVERY

### USED EQUIPMENT

Five (5) pitman assemblies for 10x20 jaw crusher, bearings S.K.F. type.
One (1) 10x20 roller bearing DIAMOND jaw crusher equipped with Timken bearings.
Three (3) 10x36 pitman assemblies for 10x36 jaw crusher.
One (1) 15x36 pitman assembly complete.
One (1) 20′0″ bucket elevator with buckets 10″x6″x 7¾″ mounted on chain.
One (1) 30″x10′0″ double shaker screen.
One (1) 9x36 stationary jaw Patt. No. 9531.
One (1) Rebuilt Allis-Chalmers power unit Model U-40, completely reconditioned.
One (1) Revolving Screen 60″x20′0″.
One (1) Grizzly and hopper and plate Feeder.
One (1) Grizzly and hopper.

### NEW EQUIPMENT

One (1) 9″x16″ bronze bearing DIAMOND jaw crusher complete with flywheels and Model P2877D2 LeRoi motor mounted on trailer unit with steel wheels.
Two (2) pitman assemblies with S.K.F. bearings including main bearings for 10″x20″ jaw crusher.
One (1) 15″x36″ roller bearing DIAMOND jaw crusher.
One (1) 15x36 pitman assembly—new design with 8″ shaft, including main bearings.
One (1) bucket elevator 32′0″ centers, rigid type, with buckets 12″x6″x7¾″ mounted on belt.
Two (2) Quarry plants with 10x20 anti-friction bearing jaw crushers and bucket elevators, mounted on trucks with four steel wheels.
Two (2) 30 cubic yard bins, 3-compartment, no jack legs.
One (1) 4′0″x8′0″ triple deck vibrator screen arranged to hang by cables.
One (1) No. 25 hog, anti-friction bearing type with cast steel discs.
Six (6) Steel wheels 40′ dia. x 16″ face to take 4″ Hyatt bearings.
Four (4) Steel wheels 40″ dia. x 10″ face to take 4″ Hyatt bearings.
Four (4) Steel Wheels 28″ dia. x 4″ face, bore 13¾″.
Ten (10) Steel wheels 28″ dia. x 5″ face, bore 1-15/16″.
Eight (8) Steel wheels 24″ dia. x 3½″ face, bore 13⅜″.
Four (4) Steel wheels 28″ dia. x 14″ face, bore 4″ Hyatt.

SPECIAL PRICES FOR QUICK SALE

**DIAMOND IRON WORKS, INC.**
**MAHR MANUFACTURING CO. DIV.**
**Minneapolis** **Minnesota**

## SURPLUS EQUIPMENT

**AIR COMPRESSORS, 2-Stage with Motor**
3—IR Imp. Type 10, cap. 600 cu. ft.
1—Sullivan WN-31, cap. 982 cu. ft.

**CRANES**
1—10-Ton Gas Type on Cats.
1—30/40-Ton Loco. Type Std. Ga.
2—20-Ton Loco. Type Std. Ga.

**ELECTRICAL EQUIPMENT**
3—300 KW, 600 V GE Rotary Converter.
1—300 KW, 600 V GE Switchgear (new).
3—300/450 KVA GE Transformers 22,000/445 V.
15, 25, 30, 50 & 200 HP. Electric Motors.

**HOISTS**
1—60 HP. Sauerman, PTE DD.
1—37 HP. Natl. 48 x 42 SD.
31—15 to 45 HP. Tuggers.
1—75 HP. Ottumwa 48 x 36.
1—100 HP. Ottumwa 54 x 78.

**LOCOMOTIVES, Elec. and Steam**
1—4-Ton, 36″ Ga. 250 V Elec. Goodman
1—5-Ton, 36″ Ga. 250 V Elec. Goodman.
3—50-Ton Std. Ga. Steam Baldwin.

**PUMPS**
1—1,000 GPM 325′ Hd. Cent.
4—4″ Dorreo Diaphragm.
2—3,000 GPM Deep Well.
1—1,000 GPM Deep Well.
1—1,650 GPM 2-Stage A-C.
7—Steam Pumps.

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10-Yd. Patt. SD Crawler.
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**CONVEYORS:** Goodman A&B Shaker
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**GOLD MACHINE:** Ainley 4-Bowl.
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**ROD MILL:** Marcy 4 x 10 RH.
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**TRACK SCALE:** 28′ Rail 100-Ton Cap.
**TRACKSHIFTER:** Std. Ga. Model N.
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225 tons, 4 compt. bin, weigh batcher.
Butler 100 yd. 3 compt. bin, weigh batcher.
2—115 tons Johnson bins, 2 compt.
Beaumont 42 yd. two compt. bin.
Multifoote 27-E paver, with 40 ft. tower.
200 ton rock storage bin, steel, heavy construction.
Fuller Kinyon bulk cement unloader, portable.
Fuller C40 rotary air compressor, electric.
Jaeger Lakewood 2 yd. concrete mixer, electric.
Smith 1 yd. tilting mixer, electric.
Ransome 1 yd. mixer, electric, practically new.
Barber-Greene 24″ reciprocating feeder.

**BUCKETS—STONE SKIPS**

22—Steel stone skips 2 to 3 yds.
1½ yd. heavy duty Blaw-Knox digging bucket.
1½ yd. Hayward rehandling clamshell.
1¼ yd. heavy duty Blaw Knox, digging, clamshell.
1 yd. Hayward clamshell, rehandling.
⅝ yd. Hals rehandling, clamshell.
1 yd Hayward orange peel, 4 leaf.
¾ yd. Hayward orange peel, 3 leaf.

**SHOVELS—CRANES**

2—Marion Diesel shovels, 1¾ yd. cap.
No. 50 Bucyrus Erie steam shovel, 2 yds. cap.
Bucyrus Erie electric tunnel shovel, 1 yd. cap.
Northwest 1 yd. comb. shovel-crane, gas.
Browning loco. crane, steam, 25 tons.
Brownhoist 10 ton crane, gas, 40 ft. boom.

**TRACTORS**

RD-8 Caterpillar, with bulldozer.
RD-7 Caterpillar, with bulldozer.
Allis-Chalmers Model 35, with bulldozer.
Caterpillar Model 30, with L.P. bulldozer.

**LOCOMOTIVES—CARS**

Plymouth 24 ton, gas, standard gauge.
2—Whitcomb 4½ ton, gas, standard gauge.
2—Plymouth 20 ton, Diesel, 36″ gauge.
8—3 yd. V type 36″ ga. side dump cars.

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Gyratory crushers: K.V.S. 30, 37-S, 49; Telsmith 32, 8A, 8B; Traylor 8″; McCully 13″, 8″, 6″.
Jaw: 6x12, 9x16, 10x20, 12x26, 13x30, 15x30, 16x32, 36″x48″ 48x60.
Complete portable rock crushing plant, nearly new, with crusher, elevator, screen, etc.

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***Good Condition—Priced Low***

4—40 & 80 ton Std. ga. steam loco. 0-4-0.
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Power Shovels—Cranes—Draglines ⅜—3½ yds.

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Allis C. No. 13, Kennedy No. 37 Gyratory Crushers, 36x28" Traylor Bulldog, 36x24" Farrell Jaw Crushers.
Sand, Gravel, Water Pumps, all Kinds.
Conveyors, Elevators, Screens, all types.
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## Index to Advertisers


*Allis-Chalmers Mfg. Co. . . . . 4-5
Alloy Steel & Metals Co. . . . . 80
*American Cable Div. American Chain & Cable Co., Inc., Inside Back Cover
*American Chain & Cable Co., Inc. 22-Inside Back Cover
*American Pulverizer Co. . . . . 118
Anchor Concrete Machy. Co. . . . . 97
Atlantic Equipment Corp. . . . . 123

Bacon, Inc., Earle C. . . . . 76
*Barber-Greene Co. . . . . 23
Barrett-Cravens Co. . . . . 105
Baughman Mfg. Co. . . . . 120
Bay City Cast Stone Block Co. . . . . 106
Bay City Shovels, Inc. . . . . 1
*Bethlehem Steel Co. . . . . 9
Birmingham Rail & Locomotive Co. 127
*Blaw-Knox Co. . . . . 108
Broadcast Section . . . . . 121-127
*Brooks Equipment & Mfg. Co. . . . . 14
Buckeye Traction Ditcher Co. . . . . 17
Bucyrus-Erie Co. . . . . 30
Bucyrus-Monighan Co. . . . . 30
*Buell Engineering Co., Inc. . . . . 16
Burnham, Royal E. . . . . 126
Butler Brothers . . . . . 125

Caterpillar Tractor Co. . . . . 10
Carlyle Rubber Co., Inc. . . . . 124
Chain Belt Co. . . . . 82
Chicago Electric Co. . . . . 124
Chicago Perforating Co. . . . . 72
*Chicago Pneumatic Tool Co. . . . . 115
*Chicago Steel Foundry Co. . . . . 77
*Cincinnati Rubber Mfg. Co. . . . . 67
Cleveland Wire Cloth & Mfg. Co. . . . . 119
Consolidated Products Co., Inc. . . . . 125
Construction Machy. Co. . . . . 105
Cooper-Bessemer Corp. . . . . 78

Davenport Locomotive Works . . . . . 117
*Deister Concentrator Co. . . . . 76
*Dempster Bros., Inc. . . . . 28
DeWitt Operated Hotels . . . . . 115
*Diamond Iron Works, Inc. . . . . 120-125
*Dixie Machy. Mfg. Co. . . . . 66
Dorr Company, Inc., The . . . . . 31
Dreifus Co., Charles . . . . . 124
Dunn Mfg. Co., W. E. . . . . 119

*Eagle Iron Works . . . . . 114
*Ensign-Bickford Co., The . . . . . 26
Equipment Corporation of America 121

Fiske Brothers Refining Co. . . . . 116
Flexible Steel Lacing Co. . . . . 118
Frog Switch & Mfg. Co. . . . . 76
*Fuller Co. . . . . 29

Gates Rubber Co., The . . . . . 15
Gay, Rubert M. Division Universal Road Machy. Co. . . . . 117
Gelbman, Louis . . . . . 106
*General Electric Co. . . . . 12-13
Goodyear Tire & Rubber Co. . . . . 2
*Gruendler Crusher & Pulverizer Co. 79

*Haiss Mfg. Co., Inc. Geo. . . . . 74
*Hardinge Company . . . . . 72
Harnischfeger Corp. . . . . 119
*Hazard Wire Rope Div. of American Chain & Cable Co., Inc. . . . . 22
*Hendrick Mfg. Co. . . . . 120
Hoffman Bros. Drilling Co. . . . . 126
Hotel Barlum . . . . . 108
Hotel Philadelphian . . . . . 120
Howe Scale Co. . . . . 98

Industrial Brownhoist . . . . . 119

*Jackson & Church Co. . . . . 81
Jaeger-Lembo Machine Co. . . . . 123
*Jaeger Machine Co. . . . . 107

Kansas City Hay Press Co. . . . . 120
Kent Machine Co. . . . . 105
Keystone Driller Co. . . . . 79
Kirk & Blum Mfg. Co. . . . . 97
Kramer Corporation . . . . . 105

Lane Co., The T. J. . . . . 124
LeTourneau, Inc., R. G. . . . . 7
Lewistown Foundry & Machine Co. 120
Lima Locomotive Works, Inc. . . . . 113
*Link-Belt Co. . . . . 117
Lippman Engineering Works . . . . . 127
Ludlow-Saylor Wire Co. Inside Front Cover

Marion Steam Shovel Co. . . . . 33
*McLanahan & Stone Corp. . . . . 117
*Merrick Scale Mfg. Co. . . . . 28
Miles Mfg. Co., The . . . . . 106
*Morris Machine Works . . . . . 68
*Multiplex Concrete Machy. Co. . . . . 111

National Supply Co., The . . . . . 6
Naylor Pipe Co. . . . . 116
New Holland Machine Co. . . . . 73
*Nordberg Mfg. Co. . . . . 32
*Northern Blower Co. . . . . 114
Northwest Engineering Co. . . . . 19

*Owen Engineering Co. . . . . 128

Page Engineering Co. . . . . 65
Pennsylvania Drilling Co. . . . . 126
Plymouth Locomotive Works . . . . . 73

*Quaker Rubber Corp. . . . . 8
Quinn Wire & Iron Works . . . . . 106

Railway Accessories Co. . . . . 121
*Raymond Pulverizer Div. of Combustion Engineering Co., Inc. . . . . 34
*Reed Company, R. F. . . . . 109
Republic Rubber Division of Lee Rubber and Tire Corp. . . . . 25
*Robins Conveying Belt Co. . . . . 36
*Roebling's Sons Co., John A. . . . . 27

*Sauerman Bros., Inc. . . . . 109
Schaffer Poidometer Co. . . . . 104
Schramm, Inc. . . . . 77
Sherman Concrete Pipe Co. . . . . 106
Simplicity Engineering Co. . . . . 75
SKF Industries, Inc. . . . . 20
*Sly Mfg. Co., The W. W. . . . . 11
*Schmidth & Co., F. L. . . . . 120
Smith Engineering Works . . . . . 18
*Smith Co., The T. L. . . . . 109
Southern Iron & Equipment Co. . . . . 122
Southern Materials Corp. . . . . 124
Sprout, Waldron & Co., Inc. . . . . 120
Stanhope, Inc., R. C. . . . . 127
*Stearns Mfg. Co. . . . . 112
Stonex Industries . . . . . 108
*Stulz-Sickles Co. . . . . 114
*Sturtevant Mill Co. . . . . 21
Superior Engine Division The National Supply Co. . . . . 6

Taylor Forge & Pipe Works . . . . . 75
Thew Shovel Co. . . . . 3
Thornton Tandem Co. . . . . 71
*Traylor Engineering & Mfg. Co. . . . . 113
Twin City Iron & Wire Co. . . . . 117
*Tyler Co., W. S., The . . . . . 74

Union Wire Rope Corp. . . . . 69
U. S. Electrical Motors, Inc. . . . . 119
*Universal Concrete Pipe Co. . . . . 104
Universal Road Machy. Co. . . . . 117
Univerzagt, G. A. . . . . 121

Walsh Co., R. P. . . . . 125
*Warren Bros. Roads Co. . . . . 118
Wellman Engineering Co. . . . . 80
*Western Precipitation Corp. . . . . 63
*Williams Pat. Crusher & Pulverizer Company . . . . . 128
Worthington Pump & Machy. Corp. Back Cover


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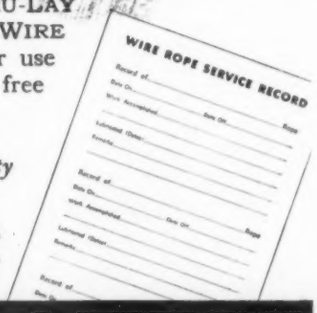


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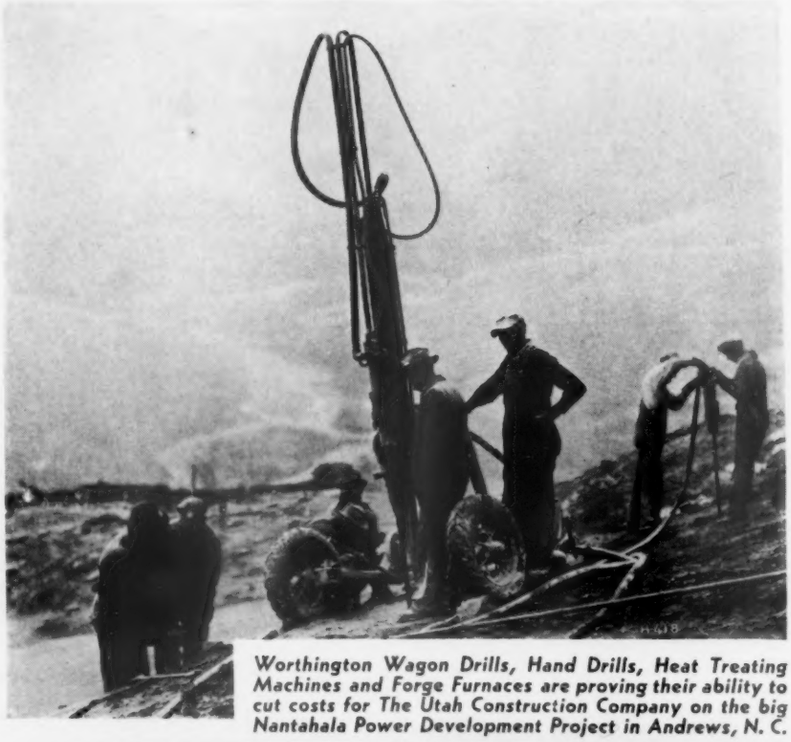

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